The OFFICIAL Amstrad Magazine

April 1986 £1.00

AMSTRAD COMPUTER USER

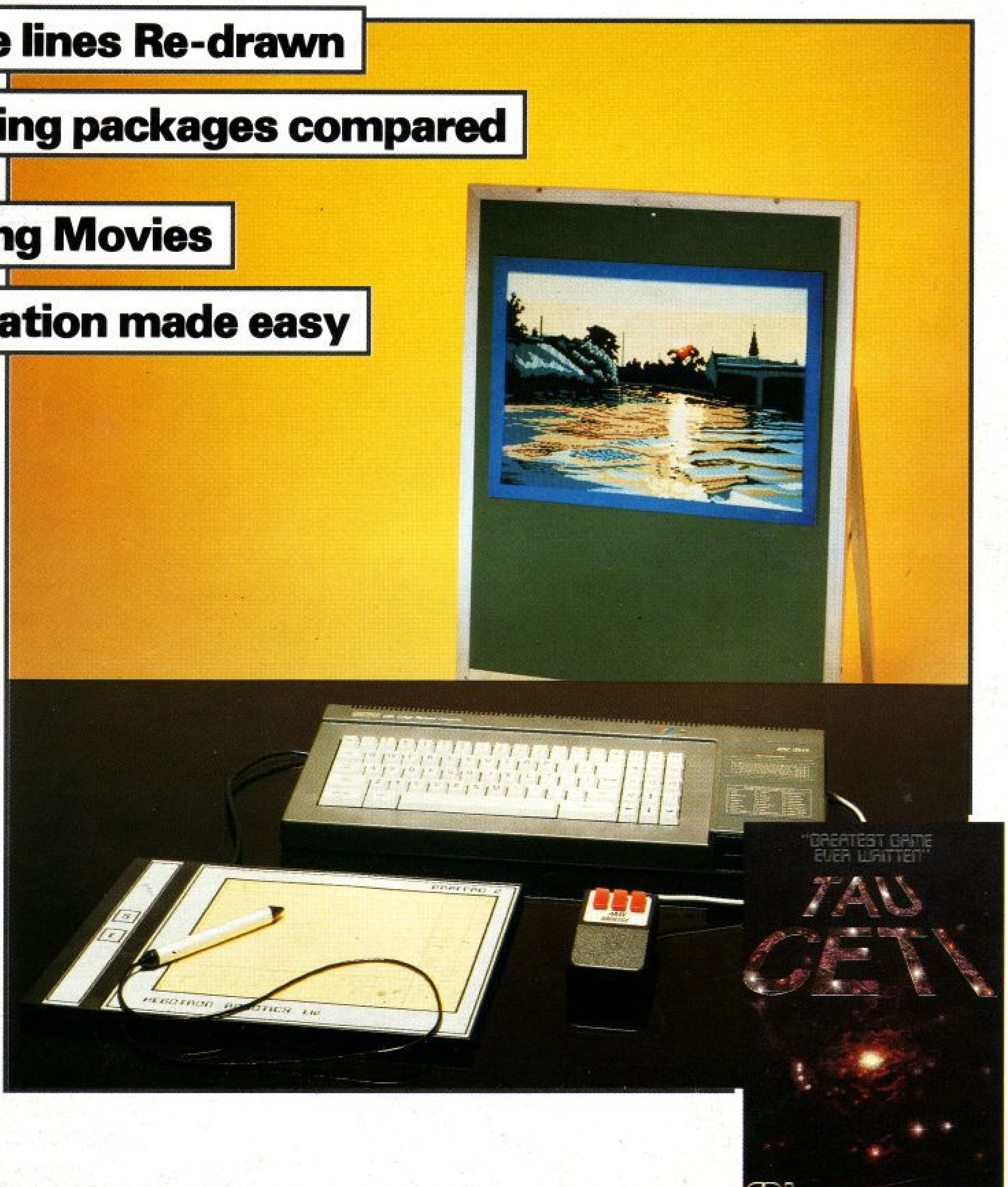
AUS $3.95 recommended NZ $4.95

Battle lines Re-drawn

Drawing packages compared

Making Movies

Animation made easy



Plus: News, Reviews, Listings and More.

Game of the Month

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ABC

AMSTRAD COMPUTER USER

169 King's Road, Brentwood, Essex CM14 4EF.
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Editor: Simon Rockman
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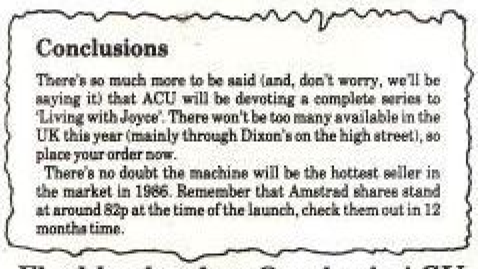
The OFFICIAL magazine for users of Amstrad computers

News trade distribution: Europress Sales & Distribution Ltd, 11 Brighton Road, Crawley, West Sussex RH10 6AF. Tel: 0293 27053.

User News...

City surprised

Amstrad surprised one of the most conservative organisations in the world, the City of London, with its figures for the first half year's trading. Amstrad


Conclusions

There's so much more to be said (and, don't worry, we'll be saying it) that ACU will be devoting a complete series to 'Living with Joyce'. There won't be too many available in the UK this year (mainly through Dixon's on the high street), so place your order now.

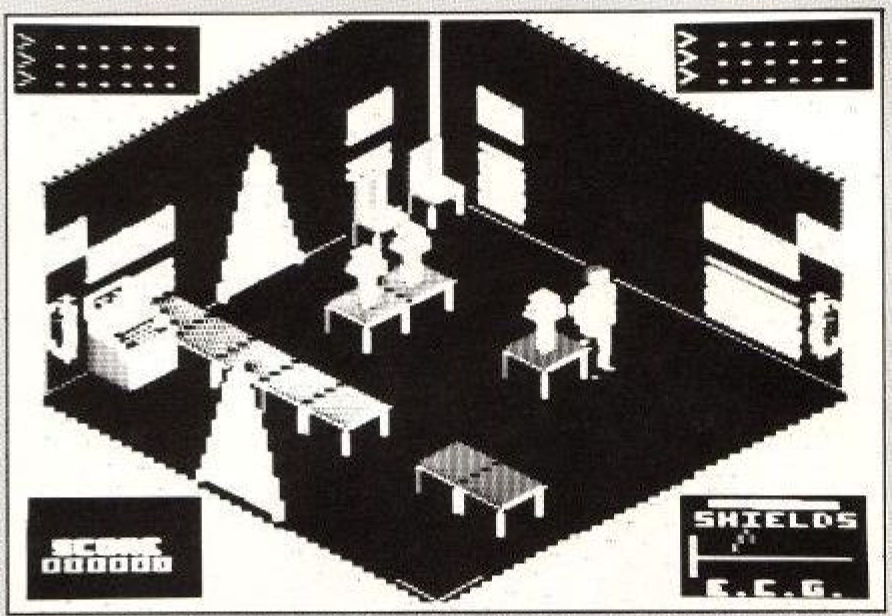
There's no doubt the machine will be the hottest seller in the market in 1986. Remember that Amstrad shares stand at around 82p at the time of the launch, check them out in 12 months time.

Flashback to last October's ACU

made £27.5 million compared with less than £10 million in the same period last year.

Most of the profit was due to the success of the computer division and the Joyce (PCW 8256) in particular. Joyce's impact is even more remarkable when you consider that it had been on sale for only two and a half months.

The City had predicted an annual profit of £35 million, now hurriedly uprated to £45 million. The effect of the figures on share prices has been dramatic. At the beginning of the year the shares were trading at around £1.80, a week after the results they approached £3.50, *Amstrad User* predicted a price rise in the October issue, when the shares stood at 82p. The Editor just wishes he had taken the author's advice.



CPC 6128 dedicated game

Software houses have been understandably reluctant to write games which take advantage of the second bank of RAM in a 6128, as games which use this memory cannot be run on a 464 or 664. Alligata have broken with this line and produced a disc-only game for the 6128 but with a cut-down tape version for 464 owners.

Meltdown uses 170k on disc and all of the 6128's memory. The layout is Knightloresque 3D and the extra RAM is used to store speech, which does not require any extra hardware.

The game involves a lot of puzzle solving. To move from one 64 room level to the next you need to win a mini-game. The program costs £8.95 for the CPC 464/664 tape and £14.95 for the full-blown 6128 version.



Firebird unleashes the Empire

British Arnold owners can thank the international nature of the Amstrad market for adding to the range of top-notch games available for their computer.

Empire is the newest game on the Firebird Gold label. It was initially planned as a Spectrum and Commodore 64 title, to be converted to the Amstrad if it sold well enough. However a large order from Germany has pursuaded Firebird to reconsider and an Amstrad version of Empire should be available at any moment.

Empire is a shoot-em-up in space. You pilot a ship from solar system to solar system, landing on planets to mine them and visiting starbases to trade or be assigned a mission.

The space sequences are in 2D while the planet scene uses 3D. All the ship's controls are designed to look like something out of Flash Gordon. The view is through a porthole and most of the gauges use liquid levels. The price has not yet been decided.

PCW 8512 fact or fiction?

Rumours abound that Amstrad are to launch an expanded version of the PCW 8256. Although Amstrad have confirmed the existence of such a machine they refuse to be drawn on the details, price and specification.

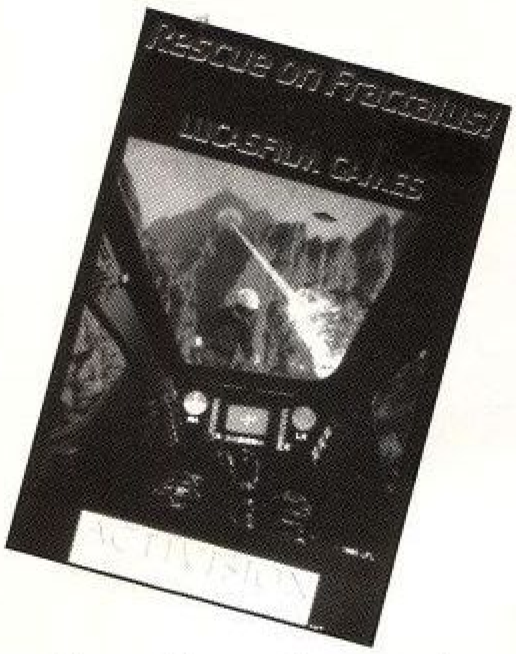
It is certainly possible to upgrade an 8256 to 512k, although this will invalidate the guarantee. With so much RAM it could be expected that the PCW 8512 would have a second disc drive, although this is just speculation.

Amstrad are very coy about discussing new releases, but have confirmed that the PCW 8256 will not be discontinued.

Great games from Activision

If you have seen Master of the Lamps you will probably find it hard to believe that Activision have anything amazing up their sleeves. How wrong you are. There are two great games in the pipeline.

Rescue on Fractalus is an established classic on the Atari 800 and Commodore 64. It will be available for the CPC computers very soon. You fly a small spaceship over the mountainous surface of a planet, looking for and rescuing the pilots of crashed spacecraft. Aliens are out to prevent this and will shoot at you from their UFOs and gun emplacements.



Eidolon is a second Activision newie, similar in feeling to Fractalus but this time you fly through a complex of caves, battling against a host of aliens.

Activision's plans go further, they have signed up the rights to six blockbuster films for the next year. The titles are a closely guarded secret but we believe that they will include Ghostbusters II and Alien II.

A bit on the side

The PCW 8256 is principally designed for word processing, but as a computer it offers a host of attractive features, one drawback for the businessman is the width of the printer, it is too narrow to take A4 paper on its side, or landscape as photographers call it.

A solution is to save the text in a file and then use a special program to print the document as a graphics dump, with all the characters rotated through 90 degrees.

Such a program is available from Trinity Business Systems, it costs £19.95, and offers a variety of fonts. Trinity can be contacted on (0603) 812195.



Nick Alexander, MD of Virgin Games, making a clean sweep.

Virgin Games on the ball

Virgin Games, voted Software House of the Year in the Amstrad User readers poll, have announced their latest release. F.A. Football is based on years of research by Tony Williams. There are some novel features – including an eight player option, but initial reaction to the game from ACU reviewers is that it is another boring football simulation.

Virgin have some much more exciting stuff in the pipeline. The first is Shogun, a Japanese combat game. Virgin also have a project based on the Eagle comic hero Dan Dare.

Got any Elite bugs?

Two hours into Elite, just about to zap your seventy second Thargoid and what happens?

Nothing. There is a bug in early versions of Elite which causes it to lock up.

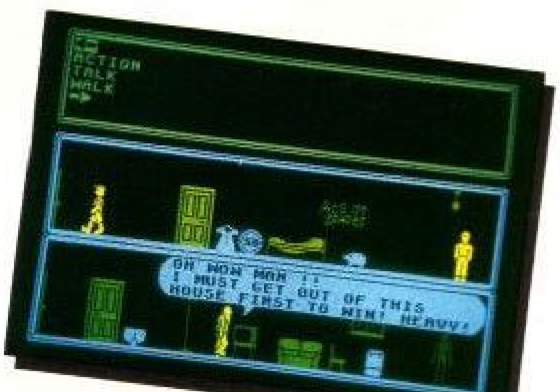
Firebird are very sorry about this and will replace any bugged copies free of charge. They will also give you a discount voucher for future Firebird products.

Have we got a video?

Orpheus have moved Rick, Mike, Vyvian and Neil on to the CPC 464. These early screen shots show how the game will look. The aim of the game is to control your character and get out of the house.











Vive l'Amstrad!



In the UK Amstrad is the No 3 computer, although it is rapidly rising to challenge those at the top of the ladder. It's a different story in France, which has a funny television system, reducing the impact of Commodore and Sinclair computers which needed to be heavily modified to work on the French Secam system. The native computer is a Thompson, but even that is No 2 to Amstrad.

The first Amstrad computer show was recently held in Paris, under the auspices of Amstrad magazine. As with the London shows, Amstrad Expo was an overwhelming success – 1,000 people were locked out on the first day.

The show may not have been as big as the London ones but there was just as much enthusiasm. The Joyce is a much more expensive machine in France (around £600) and was not nearly as popular as the Arnolds. This is surprising because l'8256 has an azerty keyboard as beloved by French typists.

We had expected to see a lot of translated English software and some pretty ropey French software (the Ed's xenophobic attitude). What we had not expected was some red hot home grown stuff. The best game we came across was Le 5eme Axe, which is reviewed in this issue. Other games of note were Crafton and Xunk, which is shortly to go on sale here from PSS and Warrior, a disc-based dungeons and dragons.

Music was very popular. There was a large display of Midi synths and a couple of Music System type composing packages. Pinball machines are much more popular in France than in the UK. Macadam Bumper has already crossed the Channel, while the Cobra pinball game has stayed put. Cobra demonstrated their game to good effect by building an Arnold into a pin table.

Despite the heavy (French) accent on games there were some more serious applications. A 464 on the Amstrad stand was running Minitel – the French cross between a telephone directory and Prestel.

The best bargain at the show was DBase II, an advanced database language which sells for £390 here but the price for the French version was a mere £70 for exactly the same thing save the translated prompts.

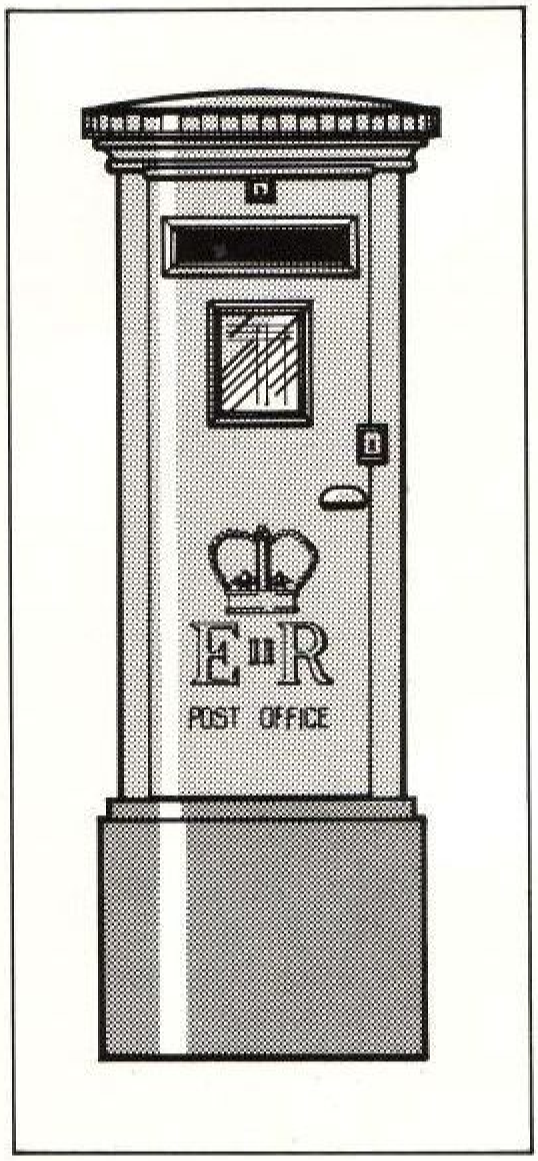
The show was spread over three days. It was good to meet so many enthusiastic Amstrad owners in a place where Amstrad is the No 1 computer manufacturer.

DAVE and PAM by ALEX & SPITAL



Write to reply

Please bear in mind that the views expressed herein are not necessarily those of Amstrad or Amsoft. Be assured that all your views are given thorough consideration. This letters section is the Amstrad Computer User's own forum.



A town called Amstrad

This letter is being sent to you from the far flung colony of Australia. I am formerly from Aldershot in Hampshire. In 1966 I emigrated to the colony of Australia to help bring Christianity to the black heathens, at which I failed miserably, most of them are still running around naked, brandishing their Woomera's (no ribald puns please) and swilling down large quantities of plonk from what they term their 'plagons', which is a twisted form of flagon.

Having been exiled in this god forbidden country of deserts, swamps and dingos for the last 18 years, I have obtained a little solace from purchasing an Amstrad 464 and disc drive, which I got from a passing trader on the camel route from Alice Springs. It cost me two fine horses, ten sheep and a signed photo of Boy George. I believe I won out in our bartering as I forged Boy Georges signature to the photo. (Besides it wasn't Boy George, it was André the Giant in drag).

Anyhow after several months, Amstrad User magazines started to appear at the outpost store. I quite naturally snaffled these up, so that I could read about how they are being used in civilisation. In fact I went so far as to order it on a regular basis, and even received one in this manner.

All of a sudden, after many months of anxious waiting, I was informed by the store keeper that Gordon And Gotch the suppliers from the big settlement in Melbourne, could no longer supply it, not even the back issues that I requested six months previous. Now my life is barren again. I am waiting to find out if Australia's equivalent of Prestel, over here it's Viatel, will be brought out on the Amstrad. The dreaded Commodore has it, but not the Ham Spread (affectionate term for Amstrad).

I could even have joined the Amstrad Club here in Australia, being run by AWA, only I lost the card I was supposed to send in (I secretly believe the house boy ate it). Is it possible for you to send me a regular subscription of Amstrad user mag. Is it possible to get all the back issues. Is Amstrad going to make it possible to plug into Viatel. How much? (moolah is this going to set me back). Well I must go now as the natives are having a Corroboree, which they say is going to bring the young men of the tribe to manhood, they remove something from them, and I'm their star guest.

Dennis O'Neill,
Nollamara 6061,
Western Australia.

ACU: Well that has just alienated half our Australian readers. Retail supplies of ACU should improve down under (Note the AUS $ price), since AWA have just doubled their order. Subscription is faster and more reliable – see the special delivery at the back of the magazine. We reviewed a collection of serial interfaces last month, if Viatel is the same as Prestel then they should work.

DR – 0 User – 0 (No score draw)

I should be interested to hear from any other PCW 8256 user who has tried to run DR Draw on the machine. Lured by the compelling advertisement from Digital Research which claimed that the program was "ready to run now on your CP/M bundled PCW 8256" I sent off a cheque and looked forward to the prompt arrival of a program that I could start to use straight away.

I was soon disillusioned. Not only did it take over six weeks for the package to arrive, after ceaseless prodding of elusive people in Basildon and Hungerford, but it also proved impossible for a person of my limited experience to load it. Like many PCW 8256 users I am a newcomer to the world of computers and the language of Basic. The instructions for preparing an operating disc which came with the package were beyond my limited comprehension.

When I buy a program, particularly at these artificially elevated prices I expect to be able to use it, and I expect the words used in the advertisement to mean what they say.

Am I alone in this respect? It seems to me that Digital Research have got a lot of explaining to do if they want to keep the PCW 8256 market.

W.G. Crampton.

ACU: DR have been known to do some funny things, but think how the poor (rich?) people who paid £200 feel.

Perpetual Music

I must congratulate Fred Gray on his fantastic music from Ocean's "The Neverending Story". I could sit and listen to it all day. I think it is a very good adventure with great graphics and very well presented.

I would recommend anyone to buy it.

Richard Devlin.

ACU: You forgot to say that you are not the programmers' cousin and haven't got shares in Ocean.

Friend of Joyce

For years I worked as a consultant in WP for Wang, IBM and ICL. I left two years ago to have a baby and began writing novels a few months ago. I was destined for the typewriter and horrors I bought one and it did not get on with me at all. What was this silly thing that required carriage returns so as not to shoot off the end of the paper?

My husband recently purchased an Amstrad WP and I had my doubts, I can tell you because of the price. But minus one or two bits which time will improve, it is perfect. Particularly the manuscript layout, it more than meets my requirements and is obviously the work of a genius.

The Amstrad, of course, is the result of a bit of thought and careful analysis of what the public really want or need. Not something computer people are very good at generally. I bet there is a lot of jealousy, I have heard some of it myself. All you competitors will have to go back to the drawing board won't they?

Anyway, I am in love with the thing and I want to give it a name which just



THINKING THINK

TASWORD 6128

THE WORD PROCESSOR

TASWORD 6128 for the Amstrad CPC 6128 disc £24.95

Brilliant value for money.
AMSTRAD ACTION
December 1985.

A powerful and easy to use word processor and a superb data merge program. AMTIX December 1985.

TASWORD 6128 is the word processor especially developed to utilise the extra memory in the CPC 6128.

The program uses ALL the additional 64K of memory in the CPC 6128 as text space. This means that text files can be around ten thousand words long.

TASWORD 6128 includes a built-in data merge program. Mail merge, in which a letter is printed any number of times, each individually addressed to a different person, is just one of the applications of this powerful facility.

The notepads are a unique feature of TASWORD 6128. Four separate notepads are available. Typing reminders and storing letter headings are just two possible applications for the notepads.

Up to one thousand characters can be stored in ten user definable keys allowing commonly used words, sentences, or even paragraphs to be typed with a single keypress.

TASWORD 6128 has comprehensive customisation features. These allow many of the program facilities to be changed to personal requirements. A customised program can be saved and includes the notepads and user definable keys.

TASWORD 6128 is fully compatible with TAS-SPELL and TASPRINT. It will also read in data from Masterfile 6128. It can even be used to enter and edit your own Basic programs.

With all standard and many extra word processing facilities TASWORD 6128 is the most powerful of the TASWORDS.

TASWORD 464

THE WORD PROCESSOR

TASWORD 464 cassette £19.95

"There is no better justification for buying a 464 than this program"
POPULAR COMPUTING WEEKLY, NOVEMBER 1984

Your 464 becomes a professional standard word processor with TASWORD 464. Supplied complete with a comprehensive manual and a cassette which contains both the program and TASWORD 464 TUTOR. This teaches you word processing using TASWORD 464. Whether you have serious applications or simply want to learn about word processing, TASWORD 464 and the TUTOR make it easy and enjoyable.

TASWORD 464-D

THE WORD PROCESSOR – WITH MAIL MERGE!

TASWORD 464-D disc £24.95

This is the new TASWORD especially developed to utilise the capabilities of the CPC 464 and 664 disc drives. The additional facilities include a larger text file size and automatic on-screen disc directories during save and load operations. A major new feature is the mail merge facility. This gives multiple prints of your standard letters, forms, etc., with each copy containing, for example, a name and address automatically taken from a disc file containing the data. This data can be entered using TASWORD 464-D, or created using the Masterfile Program Extension package. A powerful and useful conditional printing facility is included – parts of a document can be printed according to user-specified criteria. TASWORD 464-D will only run on, and is only supplied on, disc.

Available from good

Tas
SOFT

Springfield House, Hyde Terrace,

Overseas: The following distributors of Tasman products may be contacted for the address of local suppliers. Many products are supplied in translated form. FRANCE & SWITZERLAND Semaphore Logiciels, CH 1283 La Plaine, Geneva. SCANDINAVIA Kelly data, Postboks 43, Refstad, Oslo. NETHERLANDS Filosoft, PO Box 1353, 9701 BJ Groningen. U.S.A. Ramex International,

SOFTWARE?... TASMAN



TASPRINT 464
THE STYLE WRITER

TASPRINT 464 cassette £9.90
disc £12.90

A must for dot-matrix print owners! Print your program output and listings in a choice of five impressive print styles. TASPRINT 464 utilises the graphics capabilities of dot-matrix printers to form, with a double pass of the printhead, output in a range of five fonts varying from the futuristic DATA-RUN to the hand-writing style of PALACE SCRIPT. TASPRINT 464 drives the dot-matrix printers listed below and can be used to print AMSWORD/TASWORD 464 text files. TASPRINT 464 gives your output originality and style. Completely compatible with the 664 and 6128.

COMPACTA - bold and heavy, good for emphasis
DATA-RUN - A FUTURISTIC SCRIPT
LECTURA LIGHT - clean and pleasing to read
MEDIAN - a serious business-like script
PALACE SCRIPT - a distinctive flowing font

Typical Tasprint output shown at approximately half size. Please note that different makes of printer produce different sized output.

TAS-SPELL
THE SPELLING CHECKER

TAS-SPELL disc £16.50 for the Amstrad CPC 464 and 664 running TASWORD 464-D and for the CPC 6128 running TASWORD 6128

Spelling mistakes and typing errors spoil any document whether it is a private letter or your latest novel. With TAS-SPELL you are free to be creative in the confident knowledge that your spelling won't let you down.

TAS-SPELL checks the spelling of TASWORD 464-D and TASWORD 6128 text files. TAS-SPELL has a dictionary of well over twenty thousand words which it compares with the words in your text. If a word is not recognised then the relevant part of your text is displayed with the suspect word highlighted. You can correct the word, ignore it (it might be a name), or even add it to the TAS-SPELL dictionary.

Please note that TAS-SPELL will only work with TASWORD 464-D and TASWORD 6128.

TASCOPY 464
THE SCREEN COPIER

TASCOPY 464 cassette £9.90
disc £12.90

A suite of fast machine code screen copy software for the CPC 464, 664 and 6128. Print high-resolution screen copies in black and white and also large 'shaded' copies with different dot densities for the various screen colours. TASCOPY 464 also produces 'poster size' screen copies printed onto two or four sheets which can be cut and joined to make the poster.

TASPRINT 464 and TASCOPY 464 drive the following dot-matrix printers:

AMSTRAD DMP 1	MANNESMANN	STAR DMP 501/5/515	SHINWA CP-80
EPSON FX-80	TALLY MT-80	BROTHER HR5	COSMOS-80
EPSON RX-80	BROTHER M1009	DATAC PANTHER	AMSTRAD DMP 2000
EPSON MX-80 TYPE III	NEC PC-8023B-N	DATAC PANTHER II	

TASWORD UPGRADES

TASWORD 464 and Amsword owners: send your original cassette or disc (not the packaging) as proof of purchase and £13.90. Your original will be returned together with TASWORD 464-D or TASWORD 6128 on disc.

...stockists and direct from:

...man
...WARE

...Leeds LS2 9LN. Tel: (0532) 438301

If you do not want to cut this magazine, simply write out your order and post to:
TASMAN SOFTWARE, DEPT AU, SPRINGFIELD HOUSE, HYDE TERRACE, LEEDS LS2 9LN

I enclose a cheque/PO made payable to TASMAN SOFTWARE Ltd OR charge my ACCESS/VISA number: ....

	ITEM	DELETE	PRICE
NAME ______	______	disc/cassette	£ ______
ADDRESS ______	______	disc/cassette	£ ______
______	______	disc/cassette	£ ______
______	______	disc/cassette	£ ______
______	Outside Europe add £1.50 airmail per item:		£ ______
Telephone Access/Visa orders: Leeds (0532) 438301		TOTAL £	______

Please send me the FREE TASMAN brochure describing your products for the Amstrad CPC 464, 664 and 6128. ☐ tick here.
All prices include VAT, postage and packaging. AU

...GERMANY Profisoft, Sutthauser Str 50/52, D 4500 Osnabruck. BELGIUM Easy Computing, Avenue Guillaume Lefever 30, 1160 Brussels. PORTUGAL Infomova, Campo Grande 28 4 A, 1700 Lisbon. AUSTRALIA Dolphin Computers, 99 Reserve Road, Artarmon, New South Wales 2064. NEW ZEALAND Software Supplies, PO Box 865, Christchurch ... 17620 26 Mile Road, Washington MI 48094.

All TASMAN 464 software is fully compatible with the 664 and 6128.

goes to show what a darling it is. *(Joyce? – Ed).*

Thanks a lot for saving me from terminal boredom at my typewriter.

Diana Lunt.

Longer life ribbons

Until I read Mr Gerrard's article I had no way of knowing that you could get 360k on a PCW 8256 disc. Amstrad keep it quiet, so thank you very much. He makes as a reference, tongue-in-cheek, to saving on ribbons but surely since the wear appears only to be along one line this is poor design – or is it done deliberately because typewriters have always worked this wasteful way?

Of course one can use a ribbon ad nauseam in conjunction with Wiggins Teapes self-contained carbon flimsies for single sheet pulls, but that's not the point at issue. Still, an article on printing would be welcome.

Eric Ambrose.

ACU: The printer ribbons are designed with a twist at the end, so that the whole width of the ribbon is used. Another solution that can rejuvenate ribbons is to apply WD-40 silicon fluid to the ribbon surface and leave to soak for a few hours. You are advised to keep the printer head free of excess fluid.

Amstrad Sardine Show

Well somebody has got to say it! We were told "This year we've got it right – bigger venue etc" but the organisers' crystal ball was not properly programmed again. Something must be done to eliminate problems like nowhere near enough space, the stands were too small and close together and the room was stiflingly hot.

One exhibitor should be eliminated, they were selling the DMP 2000 at a special price of £169.95 *(racist bit deleted here – Ed)* so I'm still waiting patiently but happily for my printer from another supplier.

Despite all this, the show was very worthwhile and the Novotel's facilities were excellent, but for heavens sake Amstrad, get it right next time.

Ah well – third time lucky.

ACU: The Amstrad computer shows are nothing to do with Amstrad, they are officially endorsed but the involvement stops there. Predicting the success of a show is always difficult. The second show was very much bigger than the first, if you were too hot there was plenty of room downstairs where you could sit and relax.

Stand space is expensive, an hotel has to cope with hefty overheads, if the stands were made much bigger then many of the smaller companies could not afford to exhibit. It would be illegal for Amstrad, or anyone else, to fix the sale price of the DMP 2000. The company you named sold all their printers on the first morning, leaving many potential customers without a printer. Perhaps the price was too low. That is the way the laws of supply and demand work.

Socket to 'em

I own a PCW 8256 and a screwdriver, now that may not sound very exciting, but by combining the two I found something that is pretty exciting – sockets. Inside my PCW is a whole row of empty sockets – which I assume can be used to upgrade the RAM. Will Amstrad be offering an upgrade service?

ACU: There are rumours that Dictaphone will offer a suitable upgrade, although ACU can't be sure. The ubiquitous NewStar company will offer an upgrade soon but for the moment the only way to expand your Joyce is through Prism Electronics who can be reached on 01-445 9796. Remember that opening up any Amstrad computer will invalidate the guarantee.

ACU

REMS

Arrrgghhh!

I have a definition of computer torture: I have been banned from my Amstrad for a whole week because I wouldn't let my sister go on it! And what's more I've just got a new game. (Aah!). (J.J. Trice, Molescroft, N. Humberside.)

The strange case of the missing case

When I used tape based machines it always annoyed me that the software suppliers would often not supply the proper case for the cassette but rather a variety of oversize cases or no cases at all. This meant that I had to buy spare cases so that the software would fit into my storage cases.

Now that I only use discs I find that the same problem occurs. Of five recent disc based software purchases only one company (Hisoft) supplied the proper case. The other companies supplied me with plastic bags! Is there a black market in 3in disc cases, are they so valuable that leaving them out substantially reduces the cost of software or is there a law against 'pushing' them to the users? What is the point of buying neat storage boxes if suppliers will not adhere to the proper storage standards?

Do you know where I can buy spare cases and also the sticky labels? (D.R. Halliwell, Oxton, Merseyside.)

Where can I get? . . .

I would very much like to obtain the Head-Line Communications tapes on LocoScript referred to in an article in the ABC Review section in the March issue of the User Magazine.

Please could you give me the address to write to and if possible, the price of the tapes. (Mrs G. Carey, Bulford, Wilts.)

***ACU:* The Headline tapes can be obtained from all good software shops and from Newstar Software, price £9.95.**

Cartoon Fun?

Drivel!! I refer of course to your pathetic attempts to reply to CASH's criticisms of the Dave and Pam cartoon.

You base your defence around the claim that cartoons derive their humour from stereotypes. If this is so (let me point out that I think it ain't), why don't you go the whole hog and portray Pam as black and get her to talk with a comic accent. Now dat am funny, I don't think!

Let's face it; the Dave and Pam cartoons are only slightly more humorous than a weekend watching paint dry. So, unless you can find some jokes for them which rely on something more than mocking stereotypes for their laughs, why don't you just forget it?

As a forum for reviews of software and hardware and articles on how to get more out of the Amstrad Machines, ACU is doing a good job. As a comic it isn't.

In other words: Cobblers! Stick to your last! (Terry Booth, Kings Norton, Birmingham.)

***ACU:* At least our jokes are new.**

REMS

AMSTRAD PROFESSIONALS FROM DIGITAL RESEARCH

First, two powerful software development languages at just £49.95 each.



Both as complete packages of standard Amstrad 3" disks. Both configured to load and run **now** on your CP/M bundled Amstrad PCW 8256 or CPC 6128. Both offering you the applications portability and development power of professional CP/M programming languages from the creators of CP/M, Digital Research. Both at an extraordinary price, fully in keeping with Amstrad's own value for money philosophy. Both available for the first time directly to Amstrad users.

Amstrad Professionals from Digital Research will progressively expand the capabilities of your Amstrad by providing you with an armoury of professional languages, tools, utilities and graphics packages of unrivalled power and value for money in the small computer field. (See also DR GRAPH and DR DRAW overleaf, both released simultaneously with the above Amstrad Professionals titles.)

Full support available from BELL TECHNICAL SERVICES LTD

Start building your Amstrad armoury now with Amstrad Professionals from Digital Research.

Send your order and cheque or credit card number to:
DIGITAL RESEARCH (UK) LTD
Unit 12, Fenton Way
Southfields, Basildon
Essex SS15 6SL

Or contact your local Amstrad dealer.

DIGITAL RESEARCH®
The creators of CP/M™

SOFTWARE

GALLUP



This chart is based on the MicroScope chart as compiled by Gallup.

MicroScope GALLUP

MicroScope is the weekly trade paper of the microcomputer industry. If your computer store doesn't display the latest MicroScope chart, ask the manager to call Mark Salmon on 01-631 1433 — we'll send a copy every week.

	TITLE / Publisher — 4 weeks up to 8/2/86	Last Month			Months in chart	Market Strength
1	**THEY SOLD A MILLION** Hit Squad	1	-	664 D	3	100
2	**YIE AR KUNG FU** Imagine	2	-		3	90
3	**FORMULA ONE SIMULATOR** Mastertronic	4	▲	???	4	85
4	**FINDERS KEEPERS** Mastertronic	6	▲	???	7	69
5	**CAVES OF DOOM** Mastertronic	8	▲	??? -	3	68
6	**GRAND PRIX 3D** Amsoft	3	▼	A 664 D	4	67
7	**SOUL OF A ROBOT** Mastertronic	5	▼	???	4	64
8	**SKY FOX** Ariolasoft	ne	▲	664	1	57
9	**ELITE** Firebird	ne	▲	664 D	1	54
10	**COMPUTER HITS (10)** Beau Jolly	7	▼	???	3	52
11	**WHO DARES WINS 2** Alligata	14	▲	???	2	46
12	**SPELLBOUND** Mastertronic	19	▲	???	2	44
13	**HYPERSPORTS** Imagine	ne	▲	??? D	1	39
14	**ONE MAN AND HIS DROID** Mastertronic	ne	▲	???	1	38
15	**TORNADO LOW LEVEL** Vortex	ne	▲	664 D	1	35
16	**CHILLER** Mastertronic	11	▼	???	7	35
17	**NONTERRAQUEOUS** Mastertronic	12	▼	664	7	33
18	**SPITFIRE 40** Mirrorsoft	16	▼	A 664 D	2	32
19	**BARRY MCGUIGAN WORLD CHAMPIONS** Activision	ne	▲	664	1	31
20	**SCRABBLE** Leisure Genius	9	▼	664 D	6	29

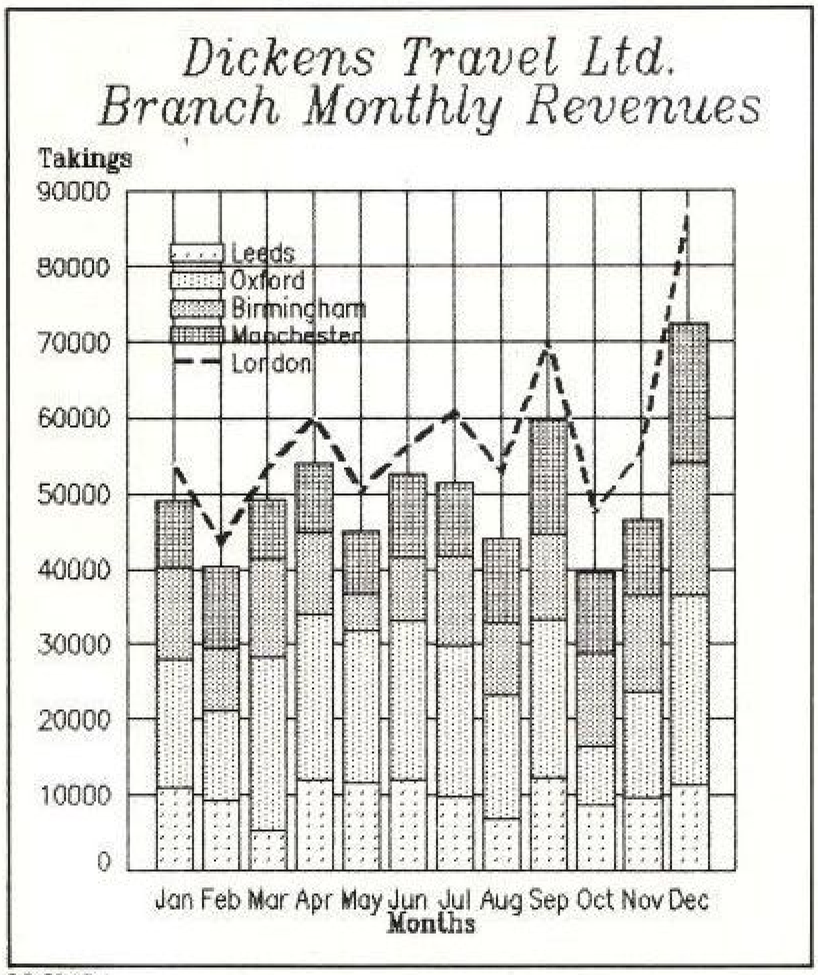
D — Available on Disc · 664 — CPC 664/6128 Compatible · A — Available from Amsoft · ??? — Untested

SOFTWARE CHART

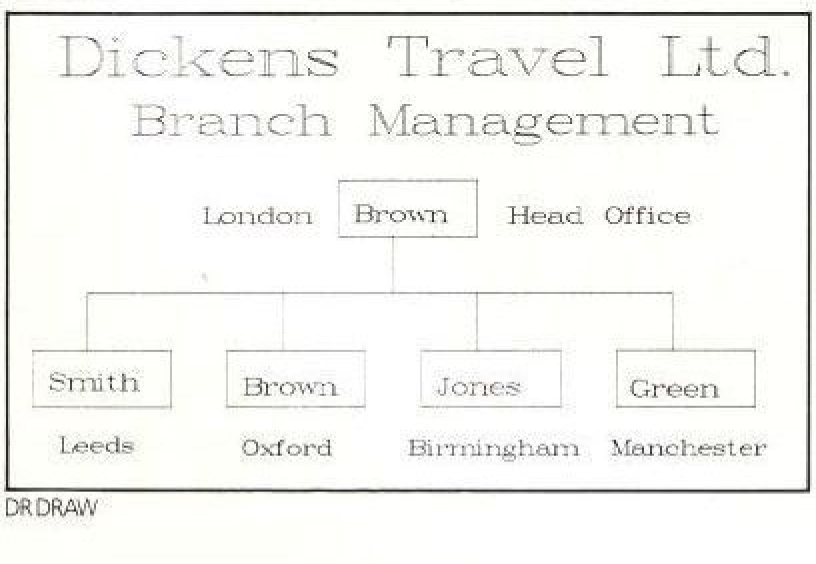
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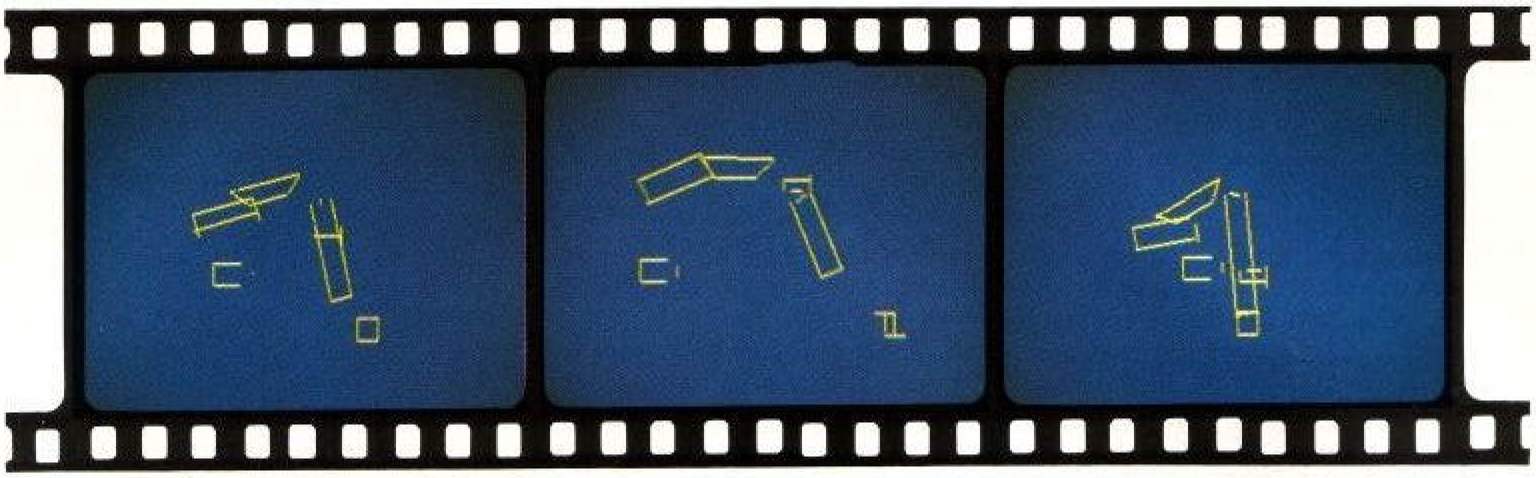
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A·N·I·M·A·T·O·R

Chris Wood presents a program to give your computer a touch of the Walt Disneys.

At last, this month I have for you the final, complete, all-singing, all-dancing Animator. The reason I didn't have it ready for you last month is because it was decided (by the Editor) that it wasn't fast enough dammit! You may have noticed yourself that as the lines lengthened, the routine slowed down, which meant it was not as spectacular as it could have been.

Faster lines

Do not let that put you off. This month everything is as promised, and more! The problem was that although the rest of my code was OK the slowest thing was the actual line drawing, and that was being done by the firmware. There was nothing for it but to trace the ROM's line drawing routine and see if it could be improved. It couldn't.

The ROM is fine for drawing ordinary lines, and is much more friendly than say, the Spectrum, in that it is quite happy to let you draw lines that are not even on the screen, and it has to cope with the screen rolling about in memory as well.

Friendly this may be, but it was not as fast as we want. So I have written my own line drawing routine. It is about four times faster in mode two, eight times faster in mode one and sixteen times faster in mode zero. I don't check for lines going off the screen, which means you must make sure your lines always stay on screen. The routine is fairly tolerant and generally the lines go off one side of the screen and wrap round to the other, but sometimes they don't, so be careful. The frame editing program does some checking, but it can't check everything.

I will explain where you should be careful when I describe the commands. In modes one and zero I halve and quarter the length of the line and only plot a half or a quarter of the points that I would in mode two. So I am happy, you will be happy, and most important of all the Editor is happy.

What does the program now do? Well, using the editor you can design as many frames consisting of up to 50 lines (although about 20 is a usable maximum) and then "tie" them together in any order you like. Say you design five frames. One is your first name, one is your last name, another is a Porsche, the fourth is a tree, and the last one is a man. By tying them together with varying speeds you can have your first name turn into the Porsche in 10 moves, the Porsche turns into your last name in 30 moves and so on. You can vary the speed, and so the smoothness, that one frame pans to the next, and you can have them going around in an endless loop, or just go from start to finish and then stop.

With enough frames you could easily



design a small cartoon. It is very easy to enter the key frames of a man walking, and have the in-betweening done by the program. The possibilities are endless, and great fun to watch.

If you don't feel up to typing in the frame editing program to start with, then you can first type in the small demo program (Listing II) to see what can be achieved. Type in the first program to generate the machine code and then run the second little program to see it in action. What it does is pick random points for five lines to go to, animates them smoothly there and then picks five more points and animates from the last set to the new ones.

If you want to skip the demo you must still type in Program I. As usual it is extensively error-checked. When that is safely done and you have no errors, save the program and type in Program III. Run the program and you will be asked which mode you want the display to be in, and how many lines you want to play with. I suggest you start with 10 lines and choose mode one. It just so happens that 10 lines is exactly the right number to make the letters ACU, which are the letters I used last time, and by an even bigger coincidence are the initials of this magazine.

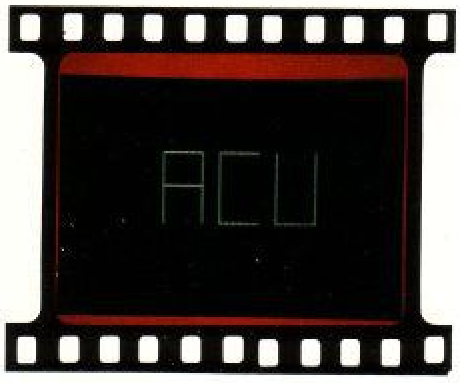
Using the editor

For the purposes of guiding you through the use of the editor I am going to assume you are going to design these letters, but feel free to choose your own. You will be greeted by left and up arrows (Hello says the arrow) at the bottom of the screen, with the number zero next to both of them, two number ones below them and the word ON next to these. There will also be part of a flashing cross in the bottom left hand corner. What you have here is an empty frame, so you must initialise it.

Press the O key for a list of options, press I for initialise and wait a few seconds. You will see a small cluster of dots in the middle of the screen and the flashing cross. Use the cursor keys with Shift to move the cross about the screen. You will see it is rubber banding the line. As you move the line you will see the coordinates at the bottom of the screen changing. If you move the cross without using Shift the cross moves by smaller amounts.

The cross moves up and down by one

pixel line, and left and right by one pixel in mode two, half a pixel in mode one, and a quarter of a pixel in mode zero. This means that even though the coordinates change when you move left and right, the cross moves a half or a quarter as fast for fine tuning. The program stops you moving off the screen when you move one pixel at a time but it doesn't check when you are using the



Shift key so make sure you stay on the screen.

Move the cross an inch or so from the cluster of dots and press the Copy key. The cross will move to the other end of the line, and you can move that into position.

OK, now about those two ones and the ON. The first one tells you which line the cross is currently attached to and the second tells you which frame you are editing. Use the ◁ and ▷ keys without pressing Shift to move from one line to the next. Hold down the ◁ key until you are at line 10. You can't go past the largest line you chose, and you can't go past one in the opposite direction.

Whenever you move from one line to another the cross is always put at the start of the line, that is the line is drawn from A,B to C,D and the cross is put at the A,B end. This is useful, as I will explain later.

Now stretch a few lines about the screen. As your lines get longer, movement about the screen will get slower because of the work Basic has to do between each update. It gets quite slow to move about the screen. By pressing Space the only thing that will be drawn is the cross, which you can position where you want before pressing Space again to see the result. This makes moving about the screen a good deal faster.

Frame to frame

Now design ACU or whatever takes your fancy in the middle of the screen. Not too big, about two inches by four. Press Enter and you will be asked "Which frame now?" Enter 2 and you will get the same blank screen as before. Press O and I to initialise again. Now press O again and this time select T for Tie together. Enter 1 as your first frame and it will be drawn. Enter 2 for your second frame and 12 for the number of steps. Just press Enter for the next two options.

Select 1 again for the next frame. This will make the program animate from 1 to 2 to 1. This time select 48 as the number of steps and again just press Enter for the next two options. When you are asked "Which frame next?" for the third time enter 999. You will see your letters growing slowly out of a cluster of dots and quickly back again. This will repeat until you press ESC ESC to break into the program. I have not checked any keys here because I want maximum speed.

Run the program as before, enter the mode and number of lines. This time you will be greeted by your first design. Press Enter and select frame two again. Now we are going to copy frame one to frame two. Press O and select the C option for Copy and enter 1 as the frame.

You can now alter your design. Redesign it to look similar, but with the lines in a different order, instead of the first four lines making up the A of ACU spread them about. When you have done this or something similar, you can slide your design around the screen. Press O



and select S for Slide. You now have the option to slide the line that the cross is attached to or to slide the whole design.

Select A for All and enter X and Y increments. Enter a positive number to move right or up, and a negative number to move left or down. Be careful to make sure that you don't give too large an offset as the design could move off the screen and you'll confuse the line drawing routine. If in doubt move in two or more stages.

Flippin' lines

Now you can press Enter and select frame three. Copy either of the two previous frames and alter frame 3. You can flip the ends of a line, so it is drawn from what was C,D to A,B. This is so you can simply slide a line from left to right, or have it rotate into place. To do this press O and select F for Flip.

You can turn a line through an angle by selecting A from the options menu and entering the angle to rotate through. Zero degrees is a straight line to the left and 90 degrees is straight up. The angle is always rotated from the A,B end of the line so if you want to rotate from the other end you must flip the line before you rotate it. Selecting P from the options menu will allow you to change the pen colour for the current line. M from the menu will allow you to magnify the length of a line, numbers less than zero will shrink the line. This means that a value of 0.5 will halve its length and a negative number will draw it in the opposite direction from the start point.

The line is always magnified from the A,B end of the line, so as with rotate, you have to flip it if you want to magnify it from the other end. You should make sure the line stays on the screen, so if in doubt, move it back. With magnify and rotate you can have your design spin from a small one up to full size. Pressing R from the options menu will return you back to the editor if you change your mind.

You should now have three frames which you can slide so they are spread about the screen. Now select T from the options menu and watch them pan from one to the other as before by selecting 999 as the last frame. You can, of course, animate in any order of frames, and you don't need to use all of them. If you had 10 frames if would be quite valid to select 3, 5, 1, 3, 999. Press ESC ESC and run the program again. This time you can try and select how many lines that you want to animate.

Designing a background

Always bear in mind that if you have fewer lines animating in a frame than in previous frames some will be left behind until the frame ends.

You can prevent this happening by making the stationary lines disappear. This is achieved by shrinking the lines down to a single dot, and then positioning them in the same place as another line, so that they can't be seen.

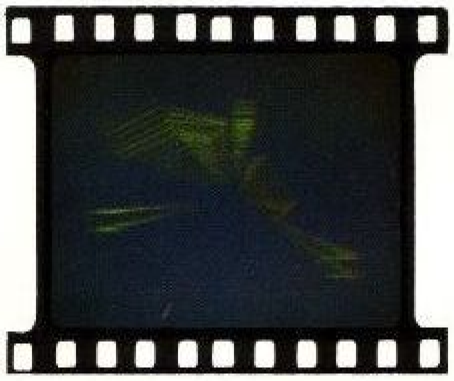
Stationary lines can be very useful if you want to build up a scene on the screen. For instance you could have a cartoon which starts with a dot in the centre of the screen. The dot grows into a house in one frame, but stays on the screen while another dot grows in to a



tree. A car could drive across the screen before turning into a road. You decide whether a line is to be erased or not by answering 1 (or any other than zero) to the question "Erase lines?" You will then be asked if you want each line to be erased at the end of its animation, to which you reply Y or N for each line in turn.

The program will then temporarily modify the frame data so that the machine code doesn't erase the last frame when it moves to the next one. If you decide to re-animate and select all lines to be erased when they had previously not been, press O for the options menu in the editor and select option E to erase. This will set all the lines in a frame back to the normal "erase at end of frame" mode.

You will notice that if you animate between two frames all the lines seem to get erased as normal, even if you want some to remain. This is because when



frame two goes back to frame one on its return journey its first frame coincides with what was its second-to-last frame on its first journey, and by erasing itself it erases the lines that were to be left behind.

This is true of any lines that you set to get left behind. If a line passes over or through them they will be erased, either slightly or completely. If one of your frames does erase something you wanted left behind, you can refresh some of your animations by copying the frames you wanted to another frame and animating it. You need as many copies of the "refresh" frames as you need to do the refreshing, as each frame can only lead to one other frame, and you cannot link in a frame twice – you have to use a copy of it.

I said that the lines are not erased on the last frame of animation, and this is true, but since the last frame of one animation is one step before the first frame of the next (otherwise one set of lines would get drawn twice) you may find that the lines are not left quite where you want them to be.

This is not a problem, as there is a very simple solution. It involves you having one extra frame which consists of all the lines simply made into a single dot which you put somewhere out of the way. You then animate from frame one to frame two, but you want frame two to stay behind. Now animate to the extra frame in one step choosing which lines you want to remain. As the first animation of frame two is also the last, it stays exactly where you want it. You can now either animate to your next frame in one step with or without erasing the lines, or you can animate with as many steps as you want, and on with your cartoon.

When you are choosing which of your lines to be erased or not erase, remember that you are choosing which lines remain of the *previous* frame when it moves to the present one, which is the one you see on the screen.

Saving a frame

When you have everything to your satisfaction you can press ESC ESC and type GOTO 2150. You will then be asked the number of lines you initially selected and the number of frames. This is the total number so if you only used 1, 5, 10, 3 out of the 10 you may have designed then enter 10 and not four or you will lose some of them. The routine at 2150 will give you the start and length of code to use in a save command.

```
SAVE "THING.BIN",b,14993,3330
```

You then only need to type:

```
MEMORY 14000:LOAD "THING.
BIN":LOAD "DESIGNER"
```

to continue where you left off. If you only want to watch your masterpiece animating then you can type in, save and run the very small Program Four, which you will notice is the same as lines 2120-2140 of the main designer. Alternatively you could also do GOTO 2120 but then you need the whole designer in memory.

Well, that's all about how to use the program, now for those of you who are interested, is a brief description of how the routine works. As I explained the month before last:

X starting coordinate=100,
Finishing coordinate=150
Number of steps=10: (150–100)/10=5 pixels each step.
X starting coordinate=100
Finishing coordinate=155
Number of steps=10: (155–100)/10=5.5 pixels each step.

In machine code you can't move by 0.5 of a pixel or any other fractions of pixels, so they get lost and at the end of the animation the frame would be 10 * 0.5 = 5 pixels out from where it should be. But if you have another counter in your machine code that stores the decimal fraction and increases the coordinates whenever a whole number is formed, then everything will be fine.

Storing the fraction to one decimal place is enough for reasonable accuracy, but because 16 is a round binary number you can get two nibbles of four bits in one byte. This gives an accuracy 16 times better than using integers. All the calculations are made in Basic, the offsets are calculated to add to each position, and each time around the loop the coordinates are increased when the value held in the nibble goes over the half byte in size, keeping the line accurate.

I said in the previous article that I would get the data for each line down from 16 bytes to six, but with all the features I have added, such as different pens, the floating/fixed point and various other little obstacles, the 16 bytes that the program required grew to 25. However I managed to get this com-

- **I** Initialise a frame with random dots in the centre of the screen.
- **S** Slide a line or a whole frame around the screen, enter an inc/decrement in the x and y coordinates.
- **M** Magnify a line. Give a number greater than one to enlarge, between zero and one to shrink a line, and a negative number to reverse its direction.
- **P** Pen. Select a new pen colour, just as in Basic.
- **A** Angle to rotate through. The angle is calculated from the start of the line. Use Flip to rotate from other end.
- **C** Copy a whole frame to the present one.
- **F** Flip a line. Make the line draw from the other end. It doesn't look any different but will make a line spin when animating.
- **T** Tie frames together. Defines the order in which to animate the frames and the number of steps/lines to go through/draw. Putting a zero as the last frame will run from start to finish and then stop. Putting 999 as your last frame will cause it to go in a continuous loop. Bear in mind when putting in a zero that if you select 1, 2, 3, 4, 1, 0 it will animate to the second-to-last animation of frame two and then stop. It will never get to the others because of the zero, but 1, 2, 3, 4, 1, 999 is valid. If you really want to go 1, 2, 3, 4, 1, 0 then copy frame one to frame five and do 1, 2, 3, 4, 1, 0 then copy frame one to frame five and do 1, 2, 3, 4, 5, 0 instead.
- **E** Erase flags. Use this if you have previously selected certain lines in a frame not to be erased and you want to change your mind, or copy it to another frame where you do want the lines, or other lines to be erased.
- **R** Return to Editor. If you change your mind when you select the Options menu.

Summary of Editor commands

pressed down to 12, which is not too bad.

Each line in a frame uses 12 bytes, each frame consists of the number of lines plus one extra space for a line that is not used. The first two bytes point to the front of the frame, the next byte points to the next frame number, and the fourth byte contains the number of lines to be animated in the frame. The last eight bytes are not used.

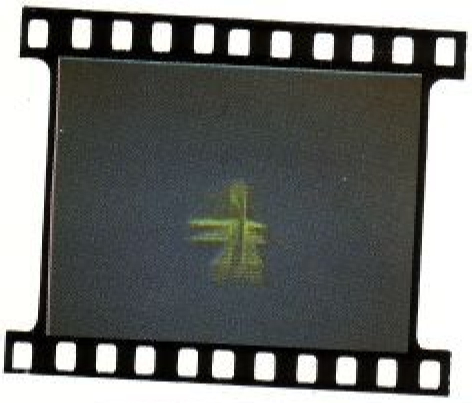
The two bytes before the first frame contain the maximum number of lines in a frame, and the number of the first frame to animate. They don't have to be in order or even start at the first one. This is called a linked list where each item leads to another one. As you have about 20k available for frames, you can calculate the maximum number of frames by using the formula:

20000/(12*(number of lines +1))

A 10 line frame uses 132 bytes, so 20000/132 will allow 151 frames. Some animations look better if a delay is inserted between frames. To do this put a FOR-NEXT loop in line 2130 between the two CALL instructions:

. . . . . . :CALL 14993:FOR z=0 to 300:NEXT z:CALL 20000: . . . . .

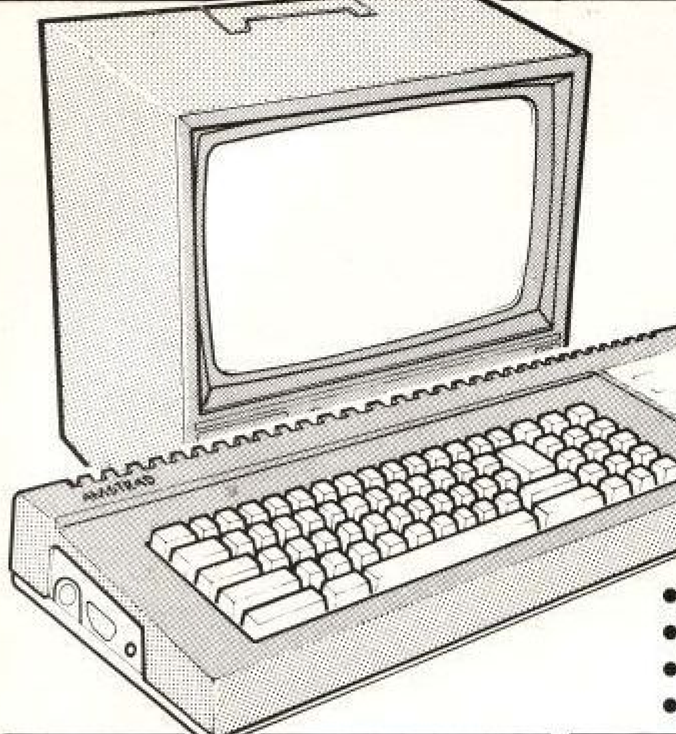
I hope you have as much fun using this program as I did writing and using it, I am sure you will.



```
10 'Program 1.
20 'ANIMATOR CODE GENERATOR
30 'BY CHRIS WOOD FOR ACU 4/2/85
40 '
50 MEMORY 14000:h=14993:DIM s(8)
60 lin=1000:add=h:FOR t=1 TO 936 STEP 8
70 chk=0:FOR b=0 TO 7
80 READ a$:a$=UPPER$(a$):n=1
90 IF LEN(a$)<>2 THEN GOTO 240
100 b$=MID$(a$,n,1)
110 GOSUB 220:IF a=0 THEN GOTO 240
120 n=n+1:IF n=2 THEN GOTO 110
130 p=VAL("&"+a$):POKE add,p
140 add=add+1:chk=chk+p
150 s(b+1)=s(b+1)+p
160 NEXT b: READ a
170 IF a<>chk THEN GOTO 240
180 PRINT "Line";lin;"OK":lin=lin+10
190 NEXT t:FOR n=1 TO 8:READ a
200 IF s(n)=a THEN NEXT:END
210 PRINT"VERTICAL CHECK ERROR":END
220 a=INSTR("0123456789ABCDEF",b$)
230 RETURN
240 PRINT"ERROR in Line";lin:END
1000 DATA DD,21,6F,3D,C3,3B,3B,3E, 801
1010 DATA 0A,A7,C8,47,F3,C5,CD,A7, 1260
1020 DATA 3A,C1,10,F9,FB,C9,DD,21, 1222
1030 DATA 6F,3D,06,08,C5,DD,22,11, 655
1040 DATA 3B,CD,C2,3A,DD,2A,11,3B, 855
1050 DATA 01,19,00,DD,09,C1,10,EC, 701
1060 DATA C9,AF,32,8C,3C,CD,F0,3A, 1129
1070 DATA CD,6D,3C,CD,F0,3A,CD,78, 1202
1080 DATA 3C,DD,2A,11,3B,CD,02,3B, 665
1090 DATA DD,2A,11,3B,DD,7E,18,32, 760
1100 DATA 8C,3C,CD,F0,3A,CD,6D,3C, 1077
1110 DATA CD,F0,3A,CD,78,3C,C9,DD, 1310
1120 DATA 5E,00,DD,56,01,DD,6E,02, 735
1130 DATA DD,66,03,01,04,00,DD,09, 561
1140 DATA C9,06,04,C5,CD,13,3B,01, 692
1150 DATA 02,00,DD,09,C1,10,F4,C9, 886
1160 DATA 1E,3E,DD,5E,00,DD,56,01, 715
1170 DATA DD,6E,08,DD,66,09,19,DD, 917
1180 DATA 7E,10,47,DD,7E,11,80,47, 776
1190 DATA E6,0F,DD,77,10,78,FE,10, 991
1200 DATA 38,01,23,DD,75,00,DD,74, 767
1210 DATA 01,C9,CD,11,BC,47,3E,02, 747
1220 DATA 90,32,6C,3C,FD,21,6C,42, 822
1230 DATA 3A,AC,3A,47,C5,DD,22,11, 828
1240 DATA 3B,CD,67,3B,DD,2A,11,3B, 765
1250 DATA 01,19,00,DD,09,01,0C,00, 269
```

Listing I

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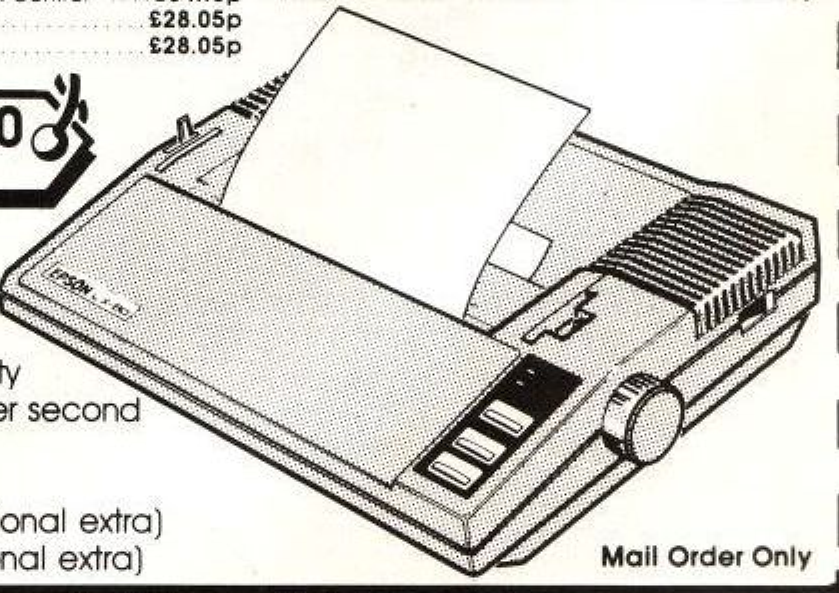
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```
10 REM PROGRAM 2
20 REM DEMO PROGRAM FOR ANIMATOR
30 REM BY CHRIS WOOD FOR ACU 4/2/86
40 RANDOMIZE 1
50 NUM=5:POKE 15020,NUM
60 st=10:fp=16:addr=17004:DTST=15727
70 FOR W=1 TO NUM:PENS=(W MOD 16)
80 GOSUB 300
90 XC=A+1024*PENS+((64*256) AND YSN<>0):
   IF XSN<>0 THEN XC=XC+128*256
100 yc=b+256*(g*16+h)
110 xyst=e+256*f
120 num=xc:GOSUB 370
130 POKE addr,lo:POKE addr+1,hi
140 num=yc:GOSUB 370
150 POKE addr+2,lo:POKE addr+3,hi
160 num=xyst:GOSUB 370
170 POKE addr+4,lo:POKE addr+5,hi
180 GOSUB 300
190 XC=A+1024*G:IF XSN<>0 THEN XC=xc+128
    *256
200 YC=B+1024*H:IF YSN<>0 THEN YC=YC+128
    *256
210 XYST=e+256*f
220 num=xc:GOSUB 370
230 POKE addr+6,lo:POKE addr+7,hi
240 num=yc:GOSUB 370
250 POKE addr+8,lo:POKE addr+9,hi
260 num=xyst:GOSUB 370
270 POKE addr+10,lo:POKE addr+11,hi
280 ADDR=ADDR+12:DTST=DTST+17:NEXT
290 CALL 14993:POKE 15001,ST:CALL 15000:
    GOTO 50
300 A=PEEK(DTST)+256*PEEK(DTST+1)
310 B=PEEK(DTST+2)
320 DTST=DTST+4
330 C=INT(RND*639)+1:D=INT(RND*199)+1
340 e=(c-a)/st:f=(d-b)/st:xsn=(e<0):ysn=
    (f<0)
350 g=INT((e-INT(e))*fp):h=INT((f-INT(f)
    )*fp)
360 e=ABS(INT(e)):f=ABS(INT(f)):RETURN
370 hi=INT(num/256):lo=num-(hi*256):RETU
    RN
```

Listing II

```
10 REM PROGRAM 4
20 REM FRAME ANIMATION EXECUTION PROGRAM
30 REM BY CHRIS WOOD FOR ACU 4/2/86
40 start=17004:CLS:A=PEEK(START-1):LINES
   =PEEK(START-2)
50 IF A<>0 THEN ADDR=(START+12*(LINES+1)
   *A)-12:POKE 15175,PEEK(ADDR):POKE 151
   76,PEEK(ADDR+1):POKE 15001,PEEK(ADDR+
   3):POKE 15020,PEEK(addr+4):CALL 14993
   :CALL 15000:A=PEEK(ADDR+2):GOTO 50
60 END
```

Listing IV

```
10 REM PROGRAM 3
20 REM FRAME DESIGNER PROGRAM
30 REM BY CHRIS WOOD FOR ACU 4/2/86
1000 INPUT "WHICH MODE";MD
1010 INPUT "HOW MANY LINES";LINES:IF LIN
     ES>50 OR LINES<1 THEN GOTO 1010
1020 MODE MD:POKE 15020,LINES:START=1700
     4:POKE (START-2),LINES:FRM=1:GOSUB
     1620
1030 GOSUB 1530:LOCATE 10,25:PRINT"ON ":
     DEG
1040 LOCATE 1,24:PRINT CHR$(246);CHR$(31
     );CHR$(10);CHR$(24);CHR$(244)
1050 st=32:fp=16:
1060 DR2=DR
1070 GOSUB 1410:' READ KEYS
1080 IF DR<>DR2 THEN GOSUB 1570
1090 C=0:D=0
1100 A=AA:B=BB
1110 IF DR=0 THEN GOSUB 1150 ELSE GOSUB
     1260
1120 PLOT AA-3,BB*2,1:DRAWR 7,0:PLOT AA,
     BB*2-3:DRAWR 0,7
1130 IF DLN=0 THEN LOCATE 2,24:PRINT AA;
     " ":LOCATE 11,24:PRINT BB*2;" ":LOC
     ATE 1,25:PRINT LNUM+1:LOCATE 5,25:P
     RINT FRM+1:CALL 14993
1140 GOTO 1060
1150 GOSUB 1370
1160 XC=A+1024*PENS+((64*256) AND YSN<>0
     ):IF XSN<>0 THEN XC=XC+128*256
1170 yc=b+256*(g*16+h)
1180 xyst=e+256*f
1190 num=xc:GOSUB 1400
1200 POKE addr,lo:POKE addr+1,hi
1210 num=yc:GOSUB 1400
1220 POKE addr+2,lo:POKE addr+3,hi
1230 num=xyst:GOSUB 1400
1240 POKE addr+4,lo:POKE addr+5,hi
1250 RETURN
1260 GOSUB 1370
1270 XC=A+1024*G:IF XSN<>0 THEN XC=xc+12
     8*256
1280 YC=B+1024*H:IF YSN<>0 THEN YC=YC+12
     8*256
1290 XYST=e+256*f
1300 num=xc:GOSUB 1400
1310 POKE addr+6,lo:POKE addr+7,hi
1320 num=yc:GOSUB 1400
1330 POKE addr+8,lo:POKE addr+9,hi
1340 num=xyst:GOSUB 1400
1350 POKE addr+10,lo:POKE addr+11,hi
1360 RETURN
1370 e=(c-a)/st:f=(d-b)/st:xsn=(e<0):ysn
     =(f<0)
1380 g=INT((e-INT(e))*fp):h=INT((f-INT(f
     ))*fp)
1390 e=ABS(INT(e)):f=ABS(INT(f)):RETURN
1400 NUM=INT(NUM):hi=INT(num/256):lo=num
     -(hi*256):RETURN
1410 PLOT AA-3,BB*2,0:DRAWR 7,0:PLOT AA,
     BB*2-3:DRAWR 0,7
1420 AA=(AA+(1 AND INKEY (1)<>-1)+(15 AN
     D INKEY (1)=32) AND AA<640)
1430 AA=(AA-(1 AND INKEY (8)<>-1)-(15 AN
     D INKEY (8)=32) AND AA>0)
1440 BB=(BB+(1 AND INKEY (0)<>-1)+(7 AND
      INKEY (0)=32) AND BB<200)
1450 BB=(BB-(1 AND INKEY (2)<>-1)-(7 AND
      INKEY (2)=32) AND BB>0)
1460 IF INKEY(34)<>-1 THEN GOTO 1650
1470 IF INKEY (9)<>-1 THEN DR=(DR=0)
1480 IF INKEY(31)<>-1 AND LNUM<>LINES-1
     THEN ADDR=ADDR+12:LNUM=LNUM+1:GOTO
     1530
1490 IF INKEY(39)<>-1 AND LNUM<>0 THEN A
     DDR=ADDR-12:LNUM=LNUM-1:GOTO 1530
1500 IF INKEY(47)<>-1 THEN DLN=(DLN=0):L
     OCATE 10,25:IF DLN=0 THEN PRINT"ON
     " ELSE PRINT"OFF"
1510 IF INKEY(18)<>-1 THEN GOSUB 1600
1520 RETURN
1530 A1=PEEK(ADDR)+256*((PEEK(ADDR+1)) A
     ND 3):B1=PEEK(ADDR+2)
1540 C1=PEEK(ADDR+6)+256*((PEEK(ADDR+7))
      AND 3):D1=PEEK(ADDR+8)
1550 pens=(PEEK(addr+1) AND 60)/4
1560 AA=A1:BB=B1:DR=0:DR2=DR:GOTO 1520
1570 IF DR=0 THEN GOTO 1590
1580 A1=AA:B1=BB:AA=C1:BB=D1:RETURN
1590 C1=AA:D1=BB:AA=A1:BB=B1:RETURN
1600 WINDOW #1,1,80,25,25:CLS #1
1610 INPUT #1,"WHICH FRAME NOW";FRM:IF F
     RM=0 THEN GOTO 1600
1620 FRM=FRM-1:ADDR=START+12*(lines+1)*F
     RM:NUM=ADDR:GOSUB 1400
1630 CLS #1
1640 POKE 15175,LO:POKE 15176,HI:LNUM=0:
     GOTO 1530
1650 WINDOW #1,1,80,25,25:CLS #1
1660 PRINT #1,"I,S,M,P,A,C,F,T,E-R"
1670 K$=INKEY$:IF K$<>"" THEN GOTO 1670
1680 A$=INKEY$:IF A$="" THEN GOTO 1670
1690 A$=UPPER$(A$):SP=INSTR("ISMPACFTER"
     ,LEFT$(A$,1)):IF SP=0 THEN GOTO 165
     0
1700 CLS #1:ON sp GOTO 1710,1730,1820,19
     00,1860,1910,1930,1940,1850,1840
1710 FOR n=1 TO lines:a=INT(RND*20)+320:
     b=INT(RND*10)+100
1720 pens=1:GOSUB 1150:GOSUB 1260:addr=a
     ddr+12:NEXT:FRM=FRM+1:GOTO 1620
1730 CLS #1:INPUT #1,"ALL OR ONE (A/O)";
     A$:A$=UPPER$(A$+" ")
1740 SP=INSTR("OA",LEFT$(A$,1)):IF SP=0
     THEN GOTO 1730
1750 ON sp GOTO 1760,1800
1760 GOSUB 1810
1770 GOSUB 1530:a1=a1+xi:b1=b1+yi:c1=c1+
     xi:d1=d1+yi:GOSUB 1560
1780 a=a1:b=b1:GOSUB 1150:a=c1:b=d1:GOSU
     B 1260
1790 RETURN
1800 GOSUB 1810:ADDR=START+12*(lines+1)*
     FRM:FOR n=1 TO lines:GOSUB 1770:add
     r=addr+12:NEXT:FRM=FRM+1:GOTO 1620
1810 CLS #1:INPUT #1,"x inc/decrease";xi
     :CLS #1:INPUT #1,"y inc/decrease";y
     i:CLS #1:RETURN
1820 CLS #1:INPUT #1,"MAGNIFICATION";MM:
     IF MM=0 THEN GOTO 1820
1830 CLS #1:GOSUB 1530:X1=C1-A1:Y1=D1-B1
     :C1=A1+(X1*MM):D1=B1+(Y1*MM):GOSUB
     1560:GOTO 1780
1840 CLS #1:RETURN
1850 ADDR=START+12*(LINES+1)*FRM:FOR W=1
      TO LINES:GOSUB 1530:GOSUB 1780:ADD
     R=ADDR+12:NEXT:RETURN
1860 CLS #1:GOSUB 1530:X1=ABS(A1-C1):Y1=
     2*(ABS(B1-D1)):X1=X1*X1:Y1=Y1*Y1:Z1
     =SQR(X1+Y1)+0.5
1870 CLS #1:INPUT #1,"ANGLE ";ROT:IF ROT
     <0 OR ROT>360 THEN GOTO 1870
1880 CLS #1:C1=A1+INT(Z1*COS(ROT)):D1=B1
     +INT((Z1*SIN(ROT))/2)
1890 GOSUB 1560:GOTO 1780
1900 CLS #1:INPUT #1,"WHICH PEN";pp:GOSU
     B 1530:pens=pp MOD 16:GOSUB 1150:CL
     S #1:RETURN
1910 CLS #1:INPUT #1,"COPY FRAME";CC:IF
     CC=0 THEN GOTO 1910
1920 CC=CC-1:LNUM=0:ADDR=START+12*FRM*(L
     ines+1):NUM=START+12*CC*(Lines+1):F
     OR N=0 TO 12*LINES:POKE ADDR+N,PEEK
     (NUM+N):NEXT:CLS #1:GOTO 1530
1930 CLS #1:GOSUB 1530:TA=A1:TB=B1:A1=C1
     :B1=D1:C1=TA:D1=TB:GOSUB 1560:GOTO
     1780
1940 CLS:INPUT "FIRST FRAME   (ENTER TO
     RETURN)";F:IF F=0 THEN CLS:RETURN
1950 CLS:PRINT F;:POKE START-1,F:FIRST=S
     TART+12*(LINES+1)*(F-1):STORE=(STAR
     T+12*(LINES+1)*F)-12
1960 NUM=FIRST:GOSUB 1400:POKE 15175,LO:
     POKE 15176,HI:CALL 14993:WINDOW #1,
     1,80,23,25
1970 CLS #1:INPUT #1,"WHICH FRAME NEXT
       (0 TO FINISH 999 FOR CONTINUOUS)"
     ;NFR
1980 SECOND=START+12*(LINES+1)*(NFR-1):N
     UM=FIRST:GOSUB 1400:POKE STORE,LO:P
     OKE STORE+1,HI:IF NFR=999 THEN GOTO
      2120
1990 POKE STORE+2,NFR
2000 IF NFR=0 THEN GOTO 2120
2010 CLS #1:INPUT #1,"HOW MANY STEPS";ST
     :POKE STORE+3,(ST-1)
2020 CLS #1:INPUT #1,"HOW MANY LINES
     (0 FOR ALL)";TNL:IF TNL=0 THEN TNL=
     LINES
2030 POKE STORE+4,(TNL MOD (LINES+1))
2040 CLS #1:INPUT #1,"ERASE LINES    (0
     FOR ALL)";ELN
2050 PRINT NFR;:CLS #1:PRINT#1,"   CALCU
     LATING"
2060 TEMP=SECOND:NUM=SECOND:GOSUB 1400:P
     OKE 15175,LO:POKE 15176,HI:CALL 149
     93:FOR W=1 TO LINES
2070 addr=first:GOSUB 1530:a=a1:b=b1:add
     r=second:GOSUB 1530:c=a1:d=b1:addr=
     first:GOSUB 1150
2080 addr=first:GOSUB 1530:a=c1:b=d1:add
     r=second:GOSUB 1530:c=c1:d=d1:addr=
     first:GOSUB 1260:EF=PEEK(FIRST+7):P
     OKE FIRST+7,(EF AND 191)
2090 IF ELN<>0 THEN PRINT#1,w;:INPUT #1,
     "ERASE THIS ONE (Y/N)";E$:E$=UPPER$
     (E$+" "):IF LEFT$(E$,1)="N" THEN EF
     =PEEK(FIRST+7):POKE FIRST+7,(EF OR
     64)
2100 first=first+12:second=second+12:NEX
     T:FIRST=TEMP:STORE=(START+12*(LINES
     +1)*NFR)-12
2110 GOTO 1970
2120 start=17004:CLS:A=PEEK(START-1):LIN
     ES=PEEK(START-2)
2130 IF A<>0 THEN ADDR=(START+12*(LINES+
     1)*A)-12:POKE 15175,PEEK(ADDR):POKE
      15176,PEEK(ADDR+1):POKE 15001,PEEK
     (ADDR+3):POKE 15020,PEEK(addr+4):CA
     LL 14993:CALL 15000:A=PEEK(ADDR+2):
     GOTO 2130
2140 END
2150 INPUT "NUMBER OF LINES";LINES
2160 INPUT "NUMBER OF FRAMES";FRM
2170 PRINT 14993,(17003+12*(LINES+1)*FRM
     )-14993
```

Listing III

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C Calculate expression
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UTOPIA also sets up the function keys to contain useful definitions, eg:-

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CTRL + f0 Sets colours for 80 column work on colour screens
CTRL + f1 LIST
CTRL + f2 Set to 80 column mode
CTRL + f3 CAT
CTRL + f4-f8 ... etc
CTRL + f9 Erase backup files

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GOING LOCO

By ALEX MARTIN

THIS month I'm taking a break from plodding through the alphabet looking at each keyword, to take a look at strings.

Thin, thick or saisal?

Strings are a computers way of storing text, and many useful things can be done with them.

If you think about it, a sentence is a series of words strung together. And a word is a series of characters strung together. A computer has to have precise information to deal with, it can't handle a sentence of text unless it has all the characters that appear in it. If you were to type the sentence "I'm forever blowing bubbles" on to your computer screen you would be creating a string 27 characters long. It is important to remember that even spaces where no character appears, and also single quote marks and other punctuation symbols, are counted as characters.

Halfer$ makes no cents

Let us now look at string variables. These have ordinary variable names but end in the dollar symbol, for example:

```
a$
bill$
fred$
zap$
```

When you assign a string of characters to a string variable, you do it like this:

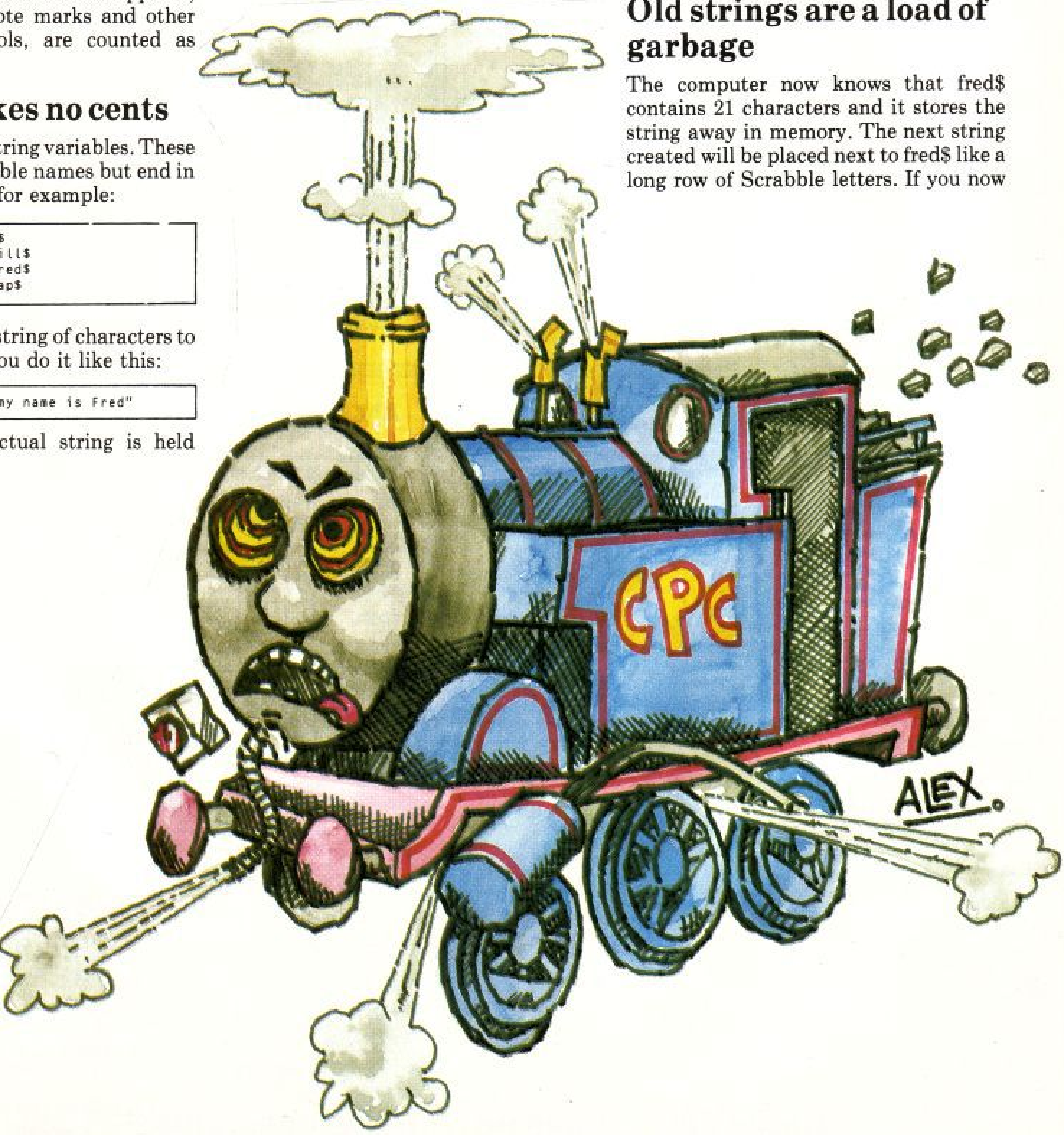
```
fred$="Hello my name is Fred"
```

Notice that the actual string is held between two sets of double quotes. This tells the computer that the information between them is a string of data. The Amstrad allows you to omit the second quote mark at the end of a string if the string is the last item in the line.

```
RUN"disc
```

Old strings are a load of garbage

The computer now knows that fred$ contains 21 characters and it stores the string away in memory. The next string created will be placed next to fred$ like a long row of Scrabble letters. If you now



added characters to fred$ like this:

```
fred$=fred$+" Smith"
```

fred$ will no longer fit into its allocated space. When this happens Basic puts fred$ into a new space and marks the old space for deletion. This means that every time you make an assignment such as fred$= a piece of memory is being used up.

As memory fills up and runs out, Basic goes back through all the old strings and deletes them, moving the remaining strings into the reclaimed space. This process is called garbage collection and is the cause of baffling pauses in large programs that make use of a lot of strings.

It can be very annoying to have to wait for quite long periods during a program. Garbage collection can be avoided but this is tricky and you will need to understand the commands and functions to do with strings.

How long is piece of string?

Twice as long as half. Or you can use the command LEN. Try this:

```
PRINT LEN(fred$)
```

and this:

```
PRINT LEN("1234567");LEN(x$)
```

As you can see, LEN returns the number of characters in the various strings. A string with no characters in is called a null string. A null string is often represented as "" and contains 0 characters. The maximum length a string can be is 255 characters long.

Cutting the strings

There are some useful functions to cut out bits of strings. These functions work by allowing you to say which character of the string to begin at and how many characters you want. The result is then assigned to another string.

MID$ is the most important of these. Look at these examples:

```
PRINT MID$("abcdefghijklm",5,3)
PRINT MID$("abcdefghijklm",5)
```

These show various parts of the string being chopped out. The first example takes three characters from the string. The second takes all the characters up to the end of the string.

The two other commands for cutting strings are RIGHT$ and LEFT$. These examples should make it clear how they work:

```
PRINT RIGHT$("abcdefghijklm",5)
PRINT LEFT$("abcdefghijklm",5)
```

Chopping without changing

We've just been looking at ways of making new strings out of old ones. Using MID$ it is possible to alter existing strings without creating a new one. It is worth reminding ourselves about garbage collection at this stage. If we can alter a string without creating a new one we can avoid Basic doing a garbage collection.

In the examples above, MID$, RIGHT$ and LEFT$ end up on the right hand side of the line of program. When MID$ is used on the left it can modify an existing string, for example:

```
a$="abcdef":MID$(a$,2)="123":PRINT a$
```

There are some subtleties that should be noted about this example. A string must exist before it can be modified. So you cannot put the string abcdef into the MID$ expression, it has to be assigned to a variable first. The characters in a$ are replaced by the characters of the string 123. As 123 does not completely obliterate all the characters in a$, some will remain unchanged.

What happens when the string being pushed in is longer than the string being pushed into? Also what happens when the MID$ command has the third parameter set, specifying the length of the gap being pushed into? And what happens when there is no space at all or MID$ is told to push characters into a character position beyond the end of the string?

Are you paying attention? Now we're asking questions

Here are some examples to try out for yourself. See if you can work out what the result will be before you enter them. Watch out for improper arguments (values not in the range 1 to length of a$).

```
a$="abcdefg":MID$(a$,5)="123456789":PRINT a$
a$="abcdefg":MID$(a$,5,2)="123456789":PRINT a$
a$="abcdefg":MID$(a$,2,5)="123":PRINT a$
a$="abcdefg":MID$(a$,2)="12":PRINT a$
a$="abcdefg":MID$(a$,0,LEN(a$))="1234567":PRINT a$
a$="abcdefg":MID$(a$,1)=SPACE$(LEN(a$)-LEN("123"))+"123"
a$="abcdefg":MID$(a$,9)="123456789"
```

Well, did you get them all right? I hope so. Understanding and using MID$ in this way can help you get the most from Locomotive Basic.

This doesn't work!

To illustrate the advantages of using this technique, here are two examples of reading a key from the keyboard:

```
10 CLS
20 LOCATE 10,10
30 PRINT"Memory being used:";FRE(0)
40 a$=INKEY$
50 GOTO 20

10 CLS
15 a$=CHR$(255)
20 LOCATE 10,10
30 PRINT"Memory being used:";FRE(0)
40 MID$(a$,1)=INKEY$
50 GOTO 20
```

In the first example every time you press a key you lose some memory. With a short program like this it's not important. With 41000 odd bytes available you would need to press a key 41000 times before Basic did a garbage collection. In a longer program, however, with more strings, it is useful to use this as there is less free memory available.

If you put REMs into line 20 and change line 30 in the above examples to PRINT a$, you'll be in for a bit of a shock. The second, better example that I've given you doesn't work properly. It carries on printing characters even after the key has been released. Well of course it does, a$ still contains a character.

INKEY$ automatically returns a null string when no key is pressed. In the first example a null string is being printed every loop. In the second, a$ with a null string pushed in, is being printed.

There are ways round this. Having printed a$, reset it to contain a character not obtainable from the keyboard. Then this character can be tested for and not printed.

Line 30 would look like this:

```
30 IF a$<>CHR$(255) THEN PRINT a$;
   :MID$(a$,1)=CHR$(255)
```

Boy is this complicated. Don't panic! If we put a character that doesn't print anything on the screen into a$, it will still be the same length but nothing will appear on the screen and we won't have to test it.

Change line 30 to do this:

```
30 PRINT a$;:MID$(a$,1)=CHR$(0)
```

Now do this

Just to test whether you've taken any of this in, here's a little exercise to try before playtime.

Write a routine that will accept any length of string and reverse the order of the characters in it, without using more than one string variable. ACU



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Into adventures with Bill Brock

At last . . .

After what seems like a lifetime, but is in fact only a few years, Melbourne House have finally released The Lord of the Rings. Was it worth all the effort on their part and the build-up of anticipation on ours?

The Hobbit remains a classic adventure, not only was it the first to have really good graphics but it also launched a new era of games that included independent characters that could be influenced, but not compelled, to follow the commands of the player. It was also the first adventure game to be linked so firmly with a well known book.

In our world of computer adventures, it is difficult to be so innovative all in one package. There was the odd bug in the original Hobbit program, but nothing that could alter its tremendous success, in fact an adventurer's library is not really complete unless it contains a copy.

This success gave Melbourne House a reputation for good software that they never lost, even though subsequent adventure programs never quite reached the same levels as The Hobbit. Shortly after the public had got their teeth into that adventure came rumours of something bigger and better still, The Lord of the Rings. This, as if you didn't already know, is professor J.R.R. Tolkien's epic trilogy about Middle Earth, of which The Hobbit was only intended to be a children's introduction.

Rumours flourished – everyone wanted to believe them – and finally became reality, at least one third real, as The Lord of the Rings computer adventure will be published, as were the books, in three separate parts. The first program is massive and is split into two parts on two cassettes. It is based on book one, The Fellowship of the Ring, which is included with the software.

The reverse side of the first cassette has a beginner's level game. This is much smaller, with fewer locations and objects to find or use but with hint messages – not help, as the instructions say – and a score facility, neither of which are in the main game. It is useful for the novice as it emphasizes the need to draw maps and in a small way hints at the puzzles to be found in adventure games. If anything it is a little too simple to solve.

True to the book

The main games may be played as independent adventures, but on completing the first part you are told to save that position. This will ensure that when starting the second part you retain your companions and objects that you have found so far. The instructions do say that it should not be impossible for an experienced adventurer to complete the second half on its own.

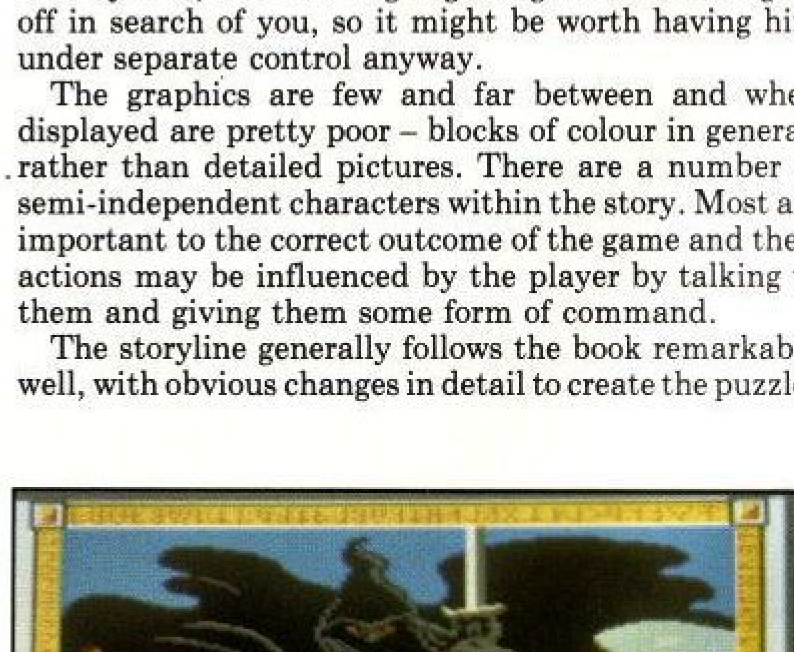
The accompanying 32 page booklet presents a fairly clear picture of what is expected of you, together with an explanation of Inglish. This is similar to that used in The Hobbit, allowing you to input quite complex sentences and also talk to other characters. The vocabulary is large, with many hundreds of words being understood.

On loading the main program – about 10 minutes – you are offered the choice of which of the four Hobbit characters – Frodo, Sam, Pippin or Merry – you wish to play (control). Those that are not under player control will generally follow the master character.

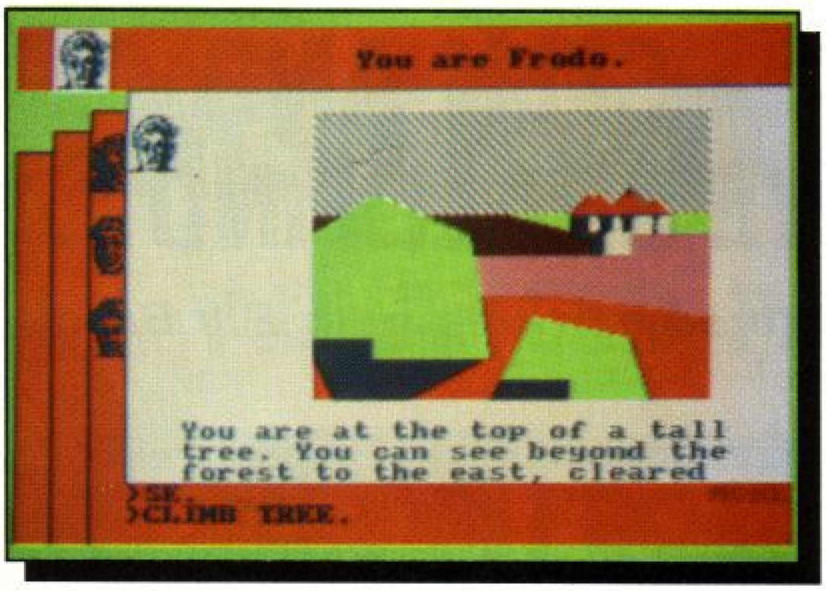
There is provision for the control of more than one character, so permitting more than one player joining in the adventure. Merry is waiting for you across the River Brandywine, take too long in getting to him and he goes off in search of you, so it might be worth having him under separate control anyway.

The graphics are few and far between and when displayed are pretty poor – blocks of colour in general, rather than detailed pictures. There are a number of semi-independent characters within the story. Most are important to the correct outcome of the game and their actions may be influenced by the player by talking to them and giving them some form of command.

The storyline generally follows the book remarkably well, with obvious changes in detail to create the puzzles



Title screen from Lord of the Rings



Frodo in action in Lord of the Rings

that make the game worth playing. The Hobbits' journey through the Old Forest, their meeting with Tom Bombadil and the Barrow-wight are all there – none of which were included in either the film or the radio versions.

Section one takes the Hobbits towards the elven retreat at Rivendell, section two, from Rivendell, through the Mines of Moria, the wood elves' realm in Lothlorien and on towards the parting of the fellowship by the River Anduin.

Mapping is, as always, very important, more so with this program than some because often directions are somewhat strange, with a number of one-way paths. One expects odd things to happen in adventures but this "movement jungle" does seem to be a bit overdone. The mazes are good too – make sure you have a guide to travel through the marshes.

Oh so slow . . .

The screen display has almost a full depth scrolling text window, this is flanked to the left by three narrow vertical windows in which are displayed the pictures of the other principal characters not present at that location, the overall effect being of four overlapping pages.

As you move your master Hobbit from one location to another those with him will briefly appear in the nearest of these windows, while they make up their minds to follow the leader, and are still at the original location.

This sounds more complicated than it is, the system is quite clear to understand in practice. The major problem being the speed, or rather lack of it, with which all this is carried out. One cannot escape the fact that the program is diabolically slow. Type in N, for Go North, and you can wait for over 20 seconds before you can give another input command – and that is with only three characters with you. After Rivendell you could have eight or nine.

What aggravates the situation is that having waited for Sam to make up his mind to follow the others you finally see "Sam enters" on the main screen, but still you cannot type in a command for several seconds (no input cursor is present) and you cannot type ahead as there is no keyboard buffer facility.

Those with nimble fingers will now be cursing because they will have started to type something in, only to have the last few letters of the command accepted, which of course will not be understood.

To give a command to another character you use the format: Say to Sam "Get the rope". This also poses problems to start with, as there is an appreciable delay in the cursor reappearing after typing in the " sign. It is very easy to have the first couple of letters after this missing.

I guess that these long delays are caused by a combination of the complexity of the parser and deciding which independent character is doing what. Then the question is: Is this inefficient programming or just a by-product of a complex program? There are some other strange results too, if you "Climb tree" all is well, but "Climb down" and you get "You climb down the map".

Several such bloomers will cause a smile to players – lots of programs that try for complex parsing occasionally exhibit such funnies. Some are not so funny, such as when you have a sword but cannot use it. What is not funny at all is when the program crashes out completely and you have to wait 13 minutes to get playing again (10 for the main program and 3 to load a saved game).

Whoops . . .

I have spotted two locations that have repeatedly been the area for a crash, one is the dark tunnel to the Old Forest where my program crashes if I have no means of lighting the way, and the second was when I dragged Tom Bombadil with me into the barrow to protect us from the Barrow-wight. He is not the answer!

Regular saves are well worth while, even if it does take three minutes. It takes longer than that to repeat your steps. Also beware of friends leading you into the path of the black riders. If you lose the magic ring to the enemy your quest is over, and because of the complexity of the program, you have to load in the main program again – another 13 minutes.

Although the above criticisms are fairly damning, I have enjoyed playing The Lord of the Rings, but it is certainly not the game for an impatient player. If you are hooked on Middle Earth you will forgive the program's bad points and enjoy it regardless, but I doubt that the program will succeeed as would befit the sequel to The Hobbit.

Think carefully . . .

Activision have produced a number of good games but until recently have given the emphasis to the Commodore 64. Now they have released Mindshadow, an adventure game for the Amstrad. Let us hope this is the first of many.

The original Mindshadow was a disc-based game for the CBM 64, calling up the graphics from disc each time you moved to a new location. Activision obviously felt that a cassette version would give the game a new lease of life and at the same time converted it for other machines.

You play the part of an agent who has been betrayed

and left to die on a desert island. To complicate matters you are suffering from amnesia. You must extricate yourself from this desperate situation and in so doing gradually piece together the clues to your identity. The action moves to a pirate ship, to England and to Luxembourg . . . enjoy your travels.

The program is in two parts (loading time about 4+ minutes) preceded by an adventure tutorial. This is all good stuff with several ideas to help the novice understand the workings of adventure games. You don't have to load this if you don't want to.

The game is well thought out and has several extra facilities that could well be taken up by othër software houses. The Amstrad's numeric keypad is used to provide 10 single key input commands – repeat last command, save and load game position, get all, drop, examine, help, quicksave, quickload and remember.

Most of these are obvious but the last three are of special interest. Quicksave will save your game position into the computer's memory and is particularly useful if you are about to attempt anything at all risky. It is very fast and its use is to be recommended. Quickload will just as quickly restore you to that quicksaved position.

Remember enables you to think about objects or people that you come across in your travels. Hopefully this thinking will trigger off a memory that will help you find your true identity.

Rapid action

Pictures and text are displayed on the screen very rapidly, so enabling players to progress at their own speed, with no delays to interrupt the thought processes. The graphics are colourful and reasonably clear, the text is displayed in 80 column mode at the bottom of the screen. On a colour monitor this is quite readable, but could be better.

Keying Enter with no input removes the picture and shows the previous commands and the replies given. Most commands are given in the usual verb/noun fashion but the parser will recognise a limited range of more complex inputs when the need is called for.

There is also a very useful facility to enter a string of commands at one time, such as N, N, E, E, S, E, GET STONE, W, W, S. This saves a great deal of time if you need to repeat a series of previously determined commands.

Help comes in a strange form – from the Condor, a somewhat enigmatic super-bird. He will only help you three times, but can come in pretty useful if he decides to put his mind to it.

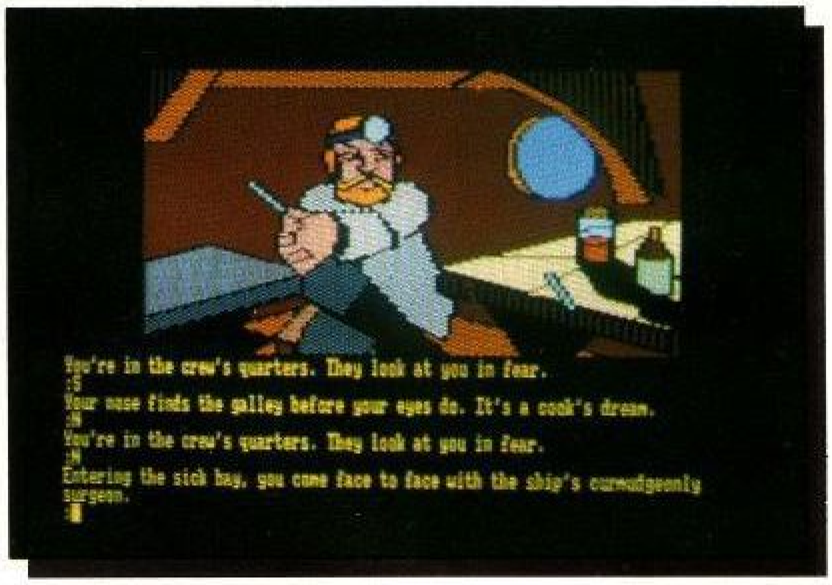
You can always cheat a little if you have used up your three wishes by starting from the beginning and following through the game up to the point where you need help, as in most games the answers to the puzzles are easy to see after you have solved them, so starting from the beginning is no great chore.

I don't think there are any red herrings, so everything you find will have a use at some time. Not all useful objects are described in the text, so look at the pictures carefully.

The locations are divided up into sections, where you are not able to move on to the next section until you have solved the present one. That does not mean that items found earlier will not be needed later.

The game is not difficult, but again is by no means easy, it utilises many of the adventurer's expected types of puzzles and so should provide a good primer for the newcomer. The clues are there, you have to find them, you also have to take some direct action on occasions and have to stoop to a little theft . . . but I suppose it's all in a good cause.

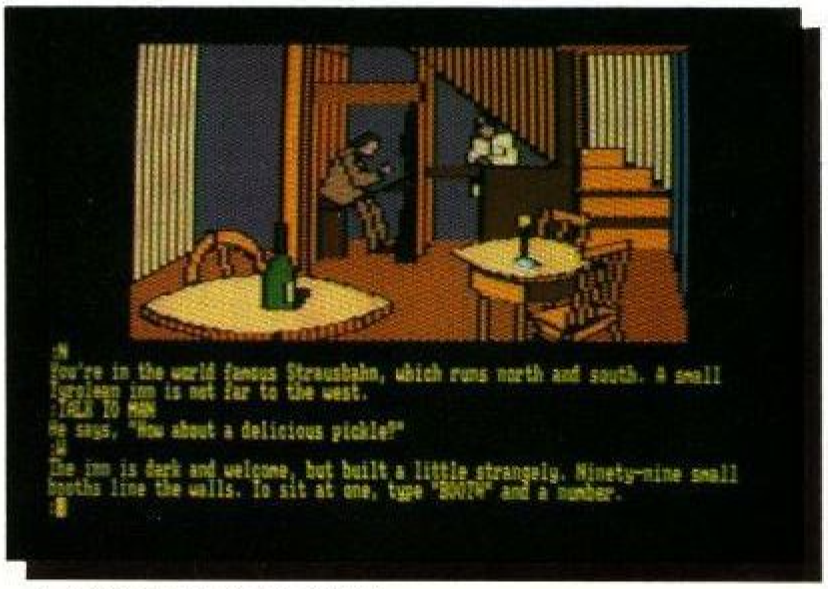
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The sick bay of Mindshadow's pirate ship



Along the world-famous Strausbahn



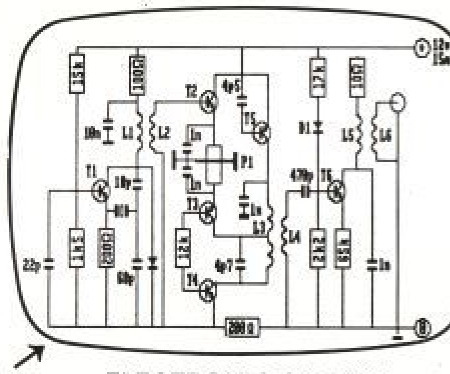
A welcome at the inn?

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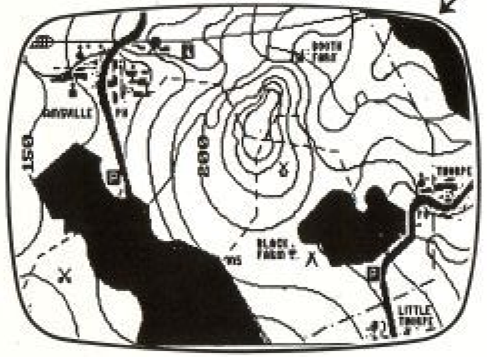


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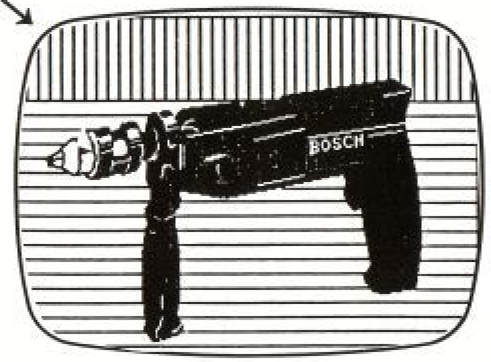
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Epson FX-85



Jeremy Vine puts the latest in Epson's family of printers through its paces

A nutty old German Professor may be able to print out his thesis quietly in the local library but I bet he can't load paper into the printer. No, I haven't been at the drinks again, this is merely the ravings of a frustrated printer user. Let me explain.

Epson seem to be forever increasing their range and the FX-85 is the latest in the FX-line of high quality dot matrix printers. It has a single parallel (Centronics) port at the rear of the machine with the option of fitting a serial interface. In common with the present trend the FX-85 has a Near Letter Quality (NLQ) mode of operation.

NLQ is becoming standard feature on dot matrix printers and one which is of great importance. The problem which they used to suffer from was that the quality of print was no way near as good as that of a daisywheel printer. This of course was no surprise and those requiring a letter quality printer would purchase the more expensive and less flexible daisywheel. Epson get round this problem by reducing the printing speed and overprinting on the same line in order to emphasise the print. This works remarkably well and the quality of NLQ print is very acceptable.

The FX-85 boasts two main modes of print. A Draft mode which prints at 160 CPS (characters per second) and the NLQ mode which is about two-thirds slower. Although there are a host of character print styles (ie italics) and commands to change the size of print, few are actually available in the NLQ mode (see Figure 1).

The most glaring omission is that NLQ italics are not available. This may not be so much an omission as a

Typestyle Summary		*(D) Draft mode only*	
	Print style (NLQ or draft) Elite characters (D) Pica characters Proportional spacing (D)	Alternative character sets	International character sets Italic (D) User-defined characters (D)
Print size commands	Condensed (D) Enlarged	Graphics (bit image) commands	Range of dot densities from 60 dots/inch to 240. The speed of printing varys between 3 to 10 inches a second.
Print enhancement commands	Emphasised Double-Strike (D) Superscript		

Figure 1

technical difficulty but I found it a great disappointment.

One of the most frustrating problems to people not acquainted with printers, is the way in which control codes are sent to a printer in order to choose a style of print. This at the best of times is confusing and can be quite a problem if the software being used doesn't allow for some easy method of sending these codes. The FX-85 allows styles of print to be chosen from the printer using SelecType. This in itself is a novelty and is a very welcome development of the FX printer.

SelecType makes use of the three buttons on the top right hand side of the printer. These buttons have dual purposes and are marked as follows:

(a) OFFLINE/ONLINE
(b) FF/NLQ
(c) LF/DRAFT

When the printer is ONLINE, pressing the NLQ or DRAFT button will select that particular mode of print. This is very straightforward and an easy way of selecting the quality of print required. Also it negates the need to send a control code from the computer. Selecting other type styles however is not as simple.

To enter the SelecType facility requires the ONLINE and FF/NLQ button to be pressed at the same time. The user can then select a choice of nine print styles. To select style number 7 (underline), the ONLINE button is pressed seven times. Each time the button is pressed, the printer beeps to reassure you that you have actually pressed a key. The function is stored by pressing the FF/NLQ button again, then the LF/DRAFT key and finally the ONLINE button to return the printer to operation.

Choosing any other print style follows the same procedure except the number of key presses is dependant on the type selection. It gets even more complicated if you want such exotic effects such as elite double-strike or condensed underlined where more than one effect is being chosen.

In principle I like the idea of SelecType. But unless you have a photographic memory, you will always need the manual in order to find the typestyle you require. Considering that Epson make large use of LCD (Liquid Crystal Display) screens in their other products, a one line display informing the user which typestyle is being selected, would surely have been no trouble. The lack of visual feedback makes selection awkward and would be so simple to implement. But for all that, it's better than no SelecType at all.

The user can define his own characters or modify existing characters. This facility is only available though in Draft mode. The design of the printer is essentially the same as previous FX models. Above the three control buttons are three LED lights, showing whether the power is on, if the printer is online and ready to print and if the printer is out of paper.

DIP switches can be easily accessed by removing the plastic lid towards the top right of the printer. This allows the user to change the DIP switch settings without the need of dismantling the entire machine, as so many other printers do. The DIP switches are an important part of the printer as you can set up the machine to your own specific requirements.

The manual that comes with the printer is, by printer manual standards, good. Manuals that come with printers are notorious for either their complexity, inaccuracy or both. The FX-85 manual contains all the relevant information and provides step by step instructions. There is a handy reference card at the back of the manual but it lacks the essential summary of SelecType commands. A bit of an oversight. The manual is not great but it's better than most.

My experience with the FX-85 was marred by only one thing – loading paper into the machine. I've never really liked the feeding mechanism on the FX printers (though an improvement over previous models) and Epson have remained faithful to the FX series by keeping this quirky system. Once understood it's manageable but like all printers from time to time, paper gets screwed up inside the machine. This can be awkward to remove and easier access to the feed wheels should have been considered by the design team.

The FX-85 uses a tractor feed mechanism but for a very limited width of paper (242 to 254mm wide). To use fanfold paper of a narrower width, like labels, an optional tractor mechanism must be purchased. This seems to be a problem that was unnecessarily created. Why on earth the built in mechanism couldn't have allowed more flexibility in moving the width of the feed wheels is beyond me. However it is likely that most people will use the standard A4 size fanfold paper, which the FX-85 (unmodified) will accept.

If you're obsessed by the problems of paper feeding, Epson provide yet another accessory for feeding single sheets of paper into the printer. The Cut Sheet Feeder slots neatly on top of the machine and allows a stack of single sheets to be fed into the printer a sheet at a time. Once more I had problems with this unit and never achieved 100% results.

Overall though, the FX-85 is an admirable addition to the FX series. It appears to be slightly quieter against previous printers but is nowhere near as hushed as Epson's new silent ink jet printers. This aside, the FX-85 is a great little beast.

Combining the various print sizes, styles, enhancements, etc, gives the user a range of printing effects to keep most of us happy. And given the odd hiccup, the FX-85 has made me very happy. My sole ambition now is to meet Epson's nutty professor (the one in the TV advert and presenter of BBC2's 'The Great Egg Race) and his mother.

The FX-85 costs £438 +VAT. The optional sheet feed costs £125 + VAT. For further details contact Epson on 01-902 8892.

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In the picture

Last August Jill Lawson looked at a variety of drawing packages. Since then many new packages have become available – how have things changed?



Screen Designer still top

During the eight months or so since my assessment of the art packages then available – when Screen Designer marginally pipped Artwork at the post – a series of increasingly sophisticated utilities have appeared on the market. The advent of the light pen has brought devices ranging from the (dare I say) ridiculous, to the fibre optic based Dart lightpen which I found great fun, but the "draw everything in pastel colours" limitation (see VAX review – *ACU* March 1986) would preclude my using it regularly as an artistic tool.

1986 sees us entering an era of icons and pull-down menus, graph pads and mice, in a bid to find quicker, easier methods of colouring each of the thousands of pixels that make up a screen display so that the end result is an acceptable image.

Just as the line-and-wash artist would not choose to work in oils and the draughtsman would eschew pastels, *(I prefer the blackcurrant ones – Ed)* the needs of each potential screen designer will vary. I can appraise the following programs only on a basis of their suitability to producing as near a photographic representation of a subject as the resolution of the CPC range will presently allow.

Rembrandt – from Beebugsoft by S. Potter

Rembrandt comes with a glossy 17-page manual which takes you step by step from loading, through simple drawing commands, to more advanced techniques by means of clear, easily understood instructions. All operations are selected from three banks of eight icons, each of whose functions are explained in the order they appear on-screen. This is fortunate, since my copy lacked the promised summary of icons in section 8 – perhaps that is going on page 18.

This program is usable in all three modes on the CPC 464, 664 and 6128 computers and will work with keyboard or joystick. Instructions are given for saving screens to disc or tape and for their use in your own programs.

It may take two or three sessions to become familiar with all the available drawing features. Selection is made with the Esc and Tab keys, cursor movement is controlled with the arrow keys and execution with the space bar. The cross hair cursor can be speeded up by pressing Shift or slowed with Ctrl, Tab and Shift give the current coordinates.

Plotting lines, circles, rectangles, polygons and horizontal-based triangles all use the rubber-band principle, enabling accurate regulation of size and position. Single colour solid boxes and circles can be drawn, overwriting any previous work in normal Ink Mode. The AND, OR and XOR Ink Modes can be used for special effects where new lines, filled boxes and the like overwrite only parts of the existing drawing – a facility with enormous possibilities if one has time to explore it to the full.

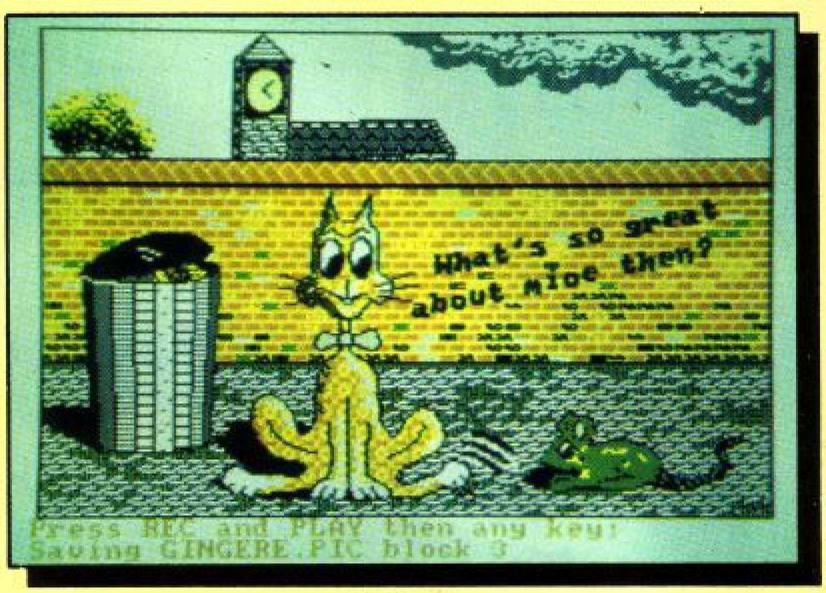
The Fill is a joy to use. Perhaps not the fastest I've known, but efficient, and with the option to Unfill if it



Rembrant uses simple icons



A Rembrant still-life



GrafPad pictures are difficult to use from your own programs

escapes or you just don't like the effect. The two-colour Stipple Fill gives a range of 10 possible colours in Mode 1, and if you don't like a solid edge to your stippled area, you can draw and fill in a solid colour, then over-fill with the desired stipple.

Single Pixel Plot can be achieved in either the variable width Freehand Draw or Line modes, but there is a Magnify, in which any small area (40 × 24 pixels in Mode 1) can be blown up to fill the whole screen for detailed work. I found the keys a little sluggish in this mode, sometimes failing to plot a pixel at the first attempt. Since each one must be fixed by pressing the space bar, dealing with large areas is very slow.

Also, given the choice, I would have preferred that it should increase twice the area to half the magnification, since it is easy to lose your bearings when a complex section of the drawing becomes just a mass of huge coloured squares. Still, I'm not going to knock it, since any Magnify is better than none. By plotting in the background colour, small areas can be erased within this mode, while larger areas can be removed with filled boxes.

A variable-size Airbrush will spray random dots if moved around, or try staying in one position while changing colours to produce some nice little six-petalled flowers.

A useful Scroll allows the whole picture to be moved, one pixel at a time, in any direction, and selecting Grid enables cursor movement to be changed to jumps of between one and 32 pixels.

Standard Text and UDGs can be placed anywhere on the screen, but no variation of size or style of text is on offer. A Cut and Paste option enables a part of the picture to be copied or moved elsewhere on the screen, but because this is restricted to a fixed-size area similar to the Magnify box, I would find it of limited use except at an early stage in a drawing.

The program also includes a screen dump to the Amstrad DMP 1 and Epson printers, giving a fully shaded result.

Conclusion

A nicely presented and documented program offering a fair number of the options one might hope for in a 1986 graphic utility, but with room for improvement in the areas mentioned – Magnify, Text, Cut and Paste. It is perhaps surprising that there is no facility to design one's own graphics.

A good, reasonably priced utility suitable for most types of drawing, and the only new one designed for use in all three screen modes, it should meet the needs of most screen artists, although for very intricate detailed drawing Screen Designer still has the slight edge with its quarter screen magnify and ease of plotting.

Rembrandt
Price £13.95 on tape £16.95 on disc. Available from Beebugsoft, PO Box 109, St Johns Road, High Wycombe, Bucks, HP10 8NP.

Grafpad 2 Art from Micro-Draw

The Grafpad is a 235cm × 360cm board with attached pen and an interface that plugs into the expansion port on your Amstrad computer. For CPC 464 owners this means tape-only operation and picture save and load, which can be very time consuming.

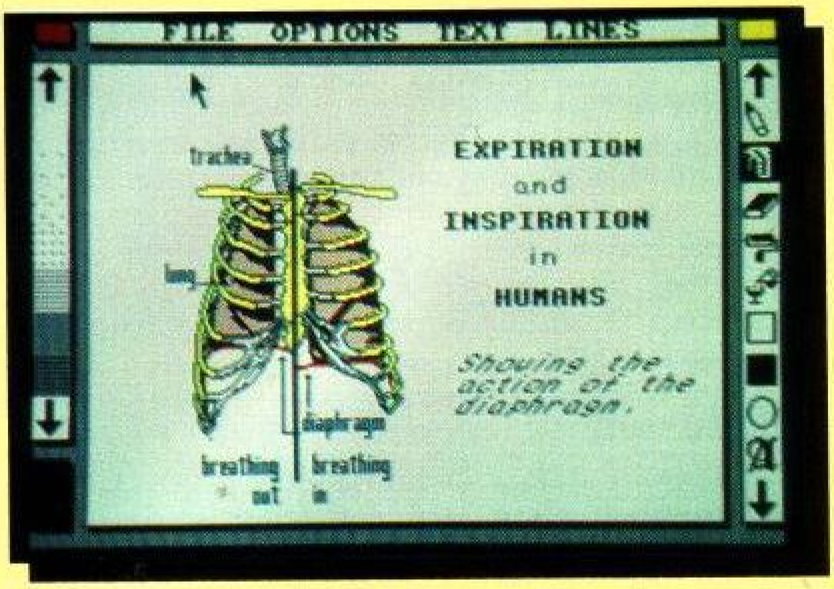
A 14-page manual sets out the various functions available under headings showing the icons which appear on the pad around the edges of the drawing area. These are laid out in such a way that the left-handed operator would find them almost impossible to use.

Instructions could have been more detailed in some sections and more stress should be laid on the precise method of holding the pen, since it is possible to hold it near the base in such a way that the device is well-nigh unusable.

Grafpad 2 operates in Mode 1 only. Colour selection is via four boxes at the top of the pad, and changing the four colours to any from a choice of 27 is simple. The drawing area makes use of most of the screen, with a two-line message pad at the foot. A GCOL feature is similar to the logical plotting in Rembrandt.

The regular cursor is a solid, non-flashing cross hair. I would have liked a hole in the middle to facilitate single pixel plotting. A full cursor will give you horizontal and vertical lines right across the screen, crossing at the current drawing point – useful for lining things up correctly.

All modes are selected by pointing the pen at the appropriate icon and pressing the E button on the left side of the pad. Each operation is terminated by



The AMX mouse is best for technical drawing



. . . but can be used for detailed artwork

pointing at the Off box and pressing E.

You will need a fairly steady hand to draw freehand but the Solid Line mode is easy to use and each offers a choice of several line thicknesses. Circle displays the radius rather than the finished circle before final positioning, and Ellipse shows a diamond shape which is difficult to relate accurately to the actual ellipse. But Square, Rectangle and Triangle are straightforward, the latter being particularly pleasant to use. Solid versions of triangles, circles, squares and rectangles can be drawn. Polygons are available and can be moved around before positioning.

Spray mode has eight different patterns but you'll need a bit of practice to achieve the desired results, and it behaves a little oddly near the left-hand edge of the screen.

The Eraser function presents probably one of the most advanced features in this package. The size of eraser varies from one pixel upwards and it rubs out only one colour at a time. This is really useful if you want to use construction lines in a different colour – it is so easy to remove them when the drawing is completed.

In contrast, the Fill is diabolical! In addition to solid colour fills there are two banks of assorted patterns which can be rotated through 90, 180 and 270 degrees – such a waste, when filling is difficult, operating in an upwards direction only from the cursor position (V shapes require very accurate initial placing). Complex shapes need many fills, and if you get it wrong – disaster! Admittedly you can stop the fill by hitting Escape – but this does not remove what has already been drawn, making you doubly grateful for the efficient rub out mode!

Text can be positioned anywhere on-screen, and the angle can be changed with up and down arrow keys. Standard, large, bold, backward and forward italics give a wide choice of sizes and styles. A coloured tail is a further option, but for anything other than standard upright it can be hard to estimate just where it will appear, since you don't see the other styles before printing.

There is a facility to draw horizontal and vertical lines of a given thickness, a ×2, ×4, ×8, ×16 and ×32 grid, an option to create a graphics window and two menus of in-program icons which can be placed anywhere necessary. The accompanying Icon Generator program enables the user to design other icons for his own purposes.

Pictures can be dumped to Epson MX, FX or compatible printers by selecting the P icon – so long as the interface doesn't get in the way when trying to connect the printer cable! No information is given on whether or not screen designs may be incorporated in your own programs. There is no Magnify facility.

Conclusion

If your eyesight is good, your hand steady and you're not given to tearing out your hair when a careless fill loses you your last three hours work, or if you're a CPC 464 owner happy to use cassette-based software or if you're a CPC 6128 user who doesn't mind having to load the program twice and and you're not left-handed, then Grafpad 2 does have a lot of very interesting features – some exclusive to this utility. Change that Fill, include an option to Unfill, and for all but the south-paws it just might be worth spending all that money.

Grafpad 2
Price £69 on tape £75 on disc (including pad and interface). Available from Grafsales, Unit 8, Carey Place, Watford, Herts, WD1 2LR.

AMX Mouse and AMX Art from AMS

The AMX Mouse is easily connected to your computer via the joystick port, drawing its power from the monitor, and can be left in place while the machine is used for other purposes. You'll need a flat surface on which to operate the mouse – if your desk doesn't run to sufficient space (and mine doesn't!) a small board on your knee will do. Once AMX Control is loaded you are asked if you wish to load AMX Art, and pressing Y automatically puts you in drawing mode.

Layout of the art screen is quite complex – four pull-down menus are listed on a bar across the top of the screen and a scrollable window on the right shows icons to determine modes and spray sizes. A similar window on the left displays at any one time seven of the 32 black and white patterns available, with the current pattern in a box at the foot. These windows are not removable, so the drawing area is considerably smaller than the total screen size. The background colour is always white, and the pattern file can be used only in black ink, but a

Pattern Designer is provided to allow the user to design and use new patterns.

Operating the mouse is simplicity itself – just three buttons, Execute, Move and Cancel – and once you've sussed out the fact that the illustration in the manual is of AMX "through the looking glass", you're on your way. Apart from one other small error in the circle-drawing instructions, the manual is clearly written and easily understood.

It takes you through explanations of each of the functions on the file, options, text and lines pull-down menus, and the purposes of the mode icons. The cursor changes form according to the icon selected and may appear as a pencil, a spray gun, a block, a paint roller or a cross hair, which serves as a reminder of your current mode.

Freehand drawing, single pixel plot and rubber-banded line drawing are handled in Pencil mode. Any of the 32 patterns may be sprayed with the spray gun, in 12 sizes (spots, blocks, mist and so on). The small-dot size can be used for freehand sketching. Rubber enables erasure in any of the spray sizes. The paint roller may be used to roll-on a pattern, as in painting.

With the Fill option any of the patterns can be used to fill an area almost instantaneously, and pressing the Cancel button will remove it just as quickly.

Boxes, solid boxes and circles of variable size can be drawn and text can be added in a variety of styles and sizes. Using a rubber-banded box, any area of the screen can be picked out and copied to a new position. Gridlock gives the user the option to move the cursor in 1, 2, 4, 8 and 16 pixel steps.

Operating only in screen Mode 1, a further two colours from a palette of 27 may be added to the drawing. Lines and boxes may be drawn in either Pen 2 or Pen 3, inverted, or in white. In Fill mode you may select a Paint option whereby the pattern window will change to show a selection of hatches, some using all four colours, which may be chosen to fill an area of the screen in the same way as the patterns, but there is no option to redesign them.

If criticism was to be made of the artistic potential of this program, it would be that it is primarily designed to execute drawings in black on a white background, and to have colour added as an optional extra, rather than as a multicolour painting tool.

However, to a great extent this is counteracted by the excellent Zoom which magnifies the area within a box to eight times its size while still allowing you to see the magnified area on the original drawing. Any of the pixels within the box may be altered to another colour, and the box itself can be scrolled across the screen.

If you have used another art program you may find that you have to adopt a different approach to creating a picture, but, once you have mastered the use of this very nice feature, you are limited only by the fact that two of the colours on your palette must be black and white.

The program is not, however, without its minor irritations. Once Save is selected you must go ahead as there is no way of cancelling this option, and I managed to lock up several hours work by accidentally trying to save to a write-protected disc.

Going directly from line draw to fill produced a corrupt cursor with which I could erase the border of the drawing area, and inexplicably I left the odd coloured box behind when zooming while drawing with a coloured pen.

Pictures may be dumped to an Epson printer, and I believe they may be used in your own programs. Of course they will not fill the whole screen but will appear with a white border.

Conclusion

Not the perfect utility, since it would have been nice to have the whole screen area available for drawing. Anyone looking for ellipses, triangles, filled circles, polygons, and any other special features could be disappointed, but – excepting those little hassles I have mentioned – a very nice, sophisticated drawing package which is easy to use and well presented. You get an Icon Designer program too, and the manual contains much information on other uses for the Mouse.

AMX Mouse
Price £69.95 (including mouse and interface). Available from Advanced Memory Systems, Freepost, Warrington WA4 1BR.

Which one should you buy?

These are three very different drawing aids, each with features that were very pleasing and each with room for improvement. If you don't have too much money to spend then Rembrandt provides an excellent basic picture designer at a very reasonable price, and it is the only one of the three which allows you to use all three screen modes.

Grafpad 2 seems overpriced with the present software which offers a lot of distinctive characteristics but also has some serious drawbacks.

If you can live with the colour, mode and screen size limitations then the AMX Mouse is possibly marginally the best buy if price is not a prime consideration, but I'll probably just carry on using Screen Designer until I see what else comes along!

	Rembrandt	Grafpad2	AMX Mouse
General ease of use	9	8	10
Speed	7	6	9
Special features	6	9	9
Freedom from problems	9	5	7
Artistic potential	10	8	9
Value for money	10	6	9
Overall assessment	9	7	9

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Romboard rivals!

Vax looks at a solution when the chips are down

Honeysoft ROM Board

"Review this ROM board for me will you?". Review it? You don't review ROM boards, you plug ROMs in them. Well, this one is sufficiently different to rate a review. It differs from most other boards in two respects; it plugs in to the top of a Maxam board and it only costs twelve quid.

It all comes in a little white box labelled "Honeysoft ROM board" (logical eh?). This box contains a manual and the 3″ × 4″ ROM board.

The board contains four sockets, four sets of links, four capacitors and four resistors. Hence only twelve quid.

The manual contains adequate instructions on the setting up of the board and warns the user against plugging or unplugging the board with the power on, and stirring cups of hot chocolate with it. The manual is however excellent for standing said hot chocolate on.

The board takes either 8k or 16k ROMs, but they must have an access time of 200ns or better. Unfortunately, different manufacturers have different ideas of what 200ns is. Some NEC ROMs claiming to be 200ns did not work in any ROM board. Utopia, Maxam and the Micropower Toolkit all worked fine in it though.

The ROM numbers are selected by swapping small plastic links. These now have a small plastic tail on them to assist extraction. The old ones were almost impossible to extract with the unaided fingernail and tended to be converted into short-range ballistic missiles when prized out with a screwdriver.

The ROMs can be numbered between 0 and 6. ROM 7 is reserved for the disc ROM because Amstrad got there first. This looks like a good point to show some of the more common locations for ROMs:

ROM	Usual Inhabitants
0	BASIC
1	—
2	—
3	—
4	—
5	Maxam
6	SI0 ROM
7	Disc ROM

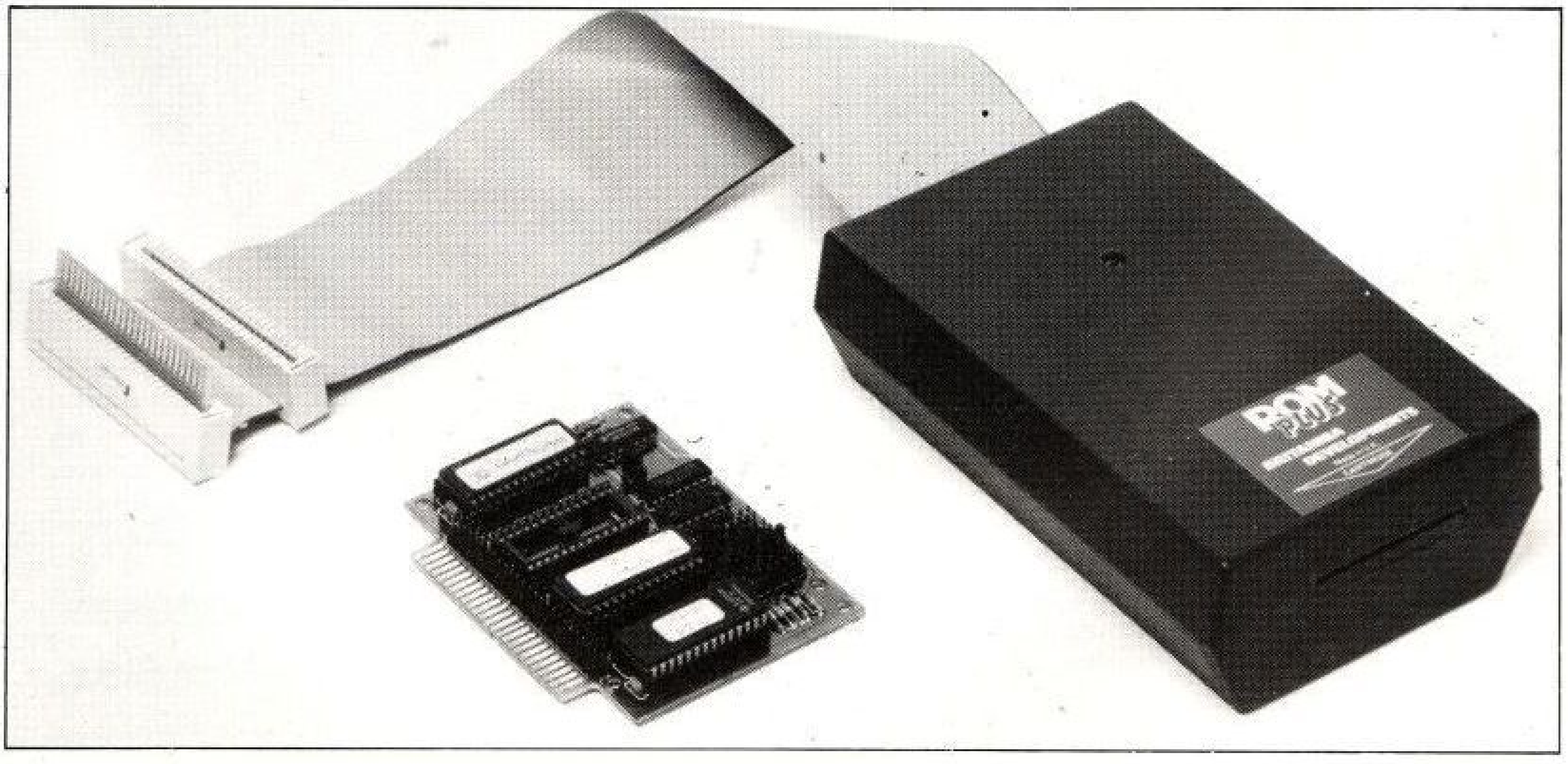
Now you see why there are only four ROM sockets.

On a 664 or a 6128 you can have 16 ROMs altogether, but not with this board. This tends to result in a ROM getting logged on twice. All is not lost, you use the Maxam ROMOFF command to nobble the extra one. Some ROMs are smart and know when they have been wound up.

The only fault I could find with this board was that the ROM sockets did not contain the usual notch which tells you which way up the ROMs go. As the manual tells you which way round they go anyway, this is not much of a fault. If you have a Maxam and need a ROM board, I have no hesitation in recommending this one, especially if you have a fetish for hot chocolate. Still, let's see what one of the opposition has to offer.

The Britannia ROM Board

This is going to impress a few people, mainly because it has a flashy, colour printed carton and a plastic box



holding all its electronic guts in. Unfortunately, this is about all it does have going for it.

First step is always to read the instructions (yea, well . . .), if you can find them. Their instructions are printed in English, French, Italian and German (wot, no Esperanto?) on the sides of the box. Yes folks, all the instructions are crammed in a 2″ by 6″ area.

The instructions do not tell you how to plug the gizmo into the back of your 464, 664 or 6128. Do you need to be told? Yes, you do – because the device has a very long ribbon cable coming out of it which has two sockets on the end of it as well as a through bus coming out of the side.

Knowing a bit about the Amstrad RS232 interface, I guessed that the first socket should have an adapter in it for the disc drive. The reason why you don't plug the disc drive into the through bus is that the 464 and its kind do not appreciate long cables, hence the adapter.

All this would not have been so bad if the connectors were keyed. As things stand, it is easy to plug in the unit the wrong way round. The Honeysoft connector is not keyed either, but the instructions for that one tell you which way is up.

Next we have to put in some ROMs. The instructions waffle a bit about the foreground and background ROMs and then tell you to put any foreground ROM in socket one. Now the clever bit: They have not numbered the sockets. They tell you in the instructions what is what, so don't lose the box and ignore the bit of PCB track that just happens to look like a one and is next to socket six.

Which way round do they go? Well, the instructions say that the notch goes on the left. The sockets are not marked as with the Honeysoft board, and the other chips on the board go every which way so don't use them as a guide. After fitting your ROM, you must change a dip-switch and then put the lid back on. Flicking these switches is somewhat easier than fiddling with the Honeysoft links as the dip switches are numbered.

The instructions also mention ROM cartridges, which can be plugged in to the back to expand your machine to "untold limits". Anyone with a firmware manual can tell you that this previously untold limit is 252 ROMs. Unfortunately, I have never seen an expansion ROM of this type, nor have I seen one of the cartridges. I am inclined to think that this idea is a non-starter. A case in point – when did you last see a Spectrum ROM cartridge?

Synopsis

If good looks alone counted, the Britannia offering would probably win. They don't though, and the Honeysoft board wins my vote, even if you do need a Maxam or Protext board to use it. For non machine-code hackers who don't know what a Maxam is, the Britannia board is no worse or more expensive than any of the other run-of-the-mill-units. The Honeysoft ROM board is available from Circuit (0992) 444111. The Britannia board costs £42.50 details from Britannia on (0222) 481135.

Amstrad Business Computing

The supplement for Amstrad Business Computer Users

Free
April 1986
Volume One
Number Five

Getting inside your PCW 8256
Programming tips for the Joyce

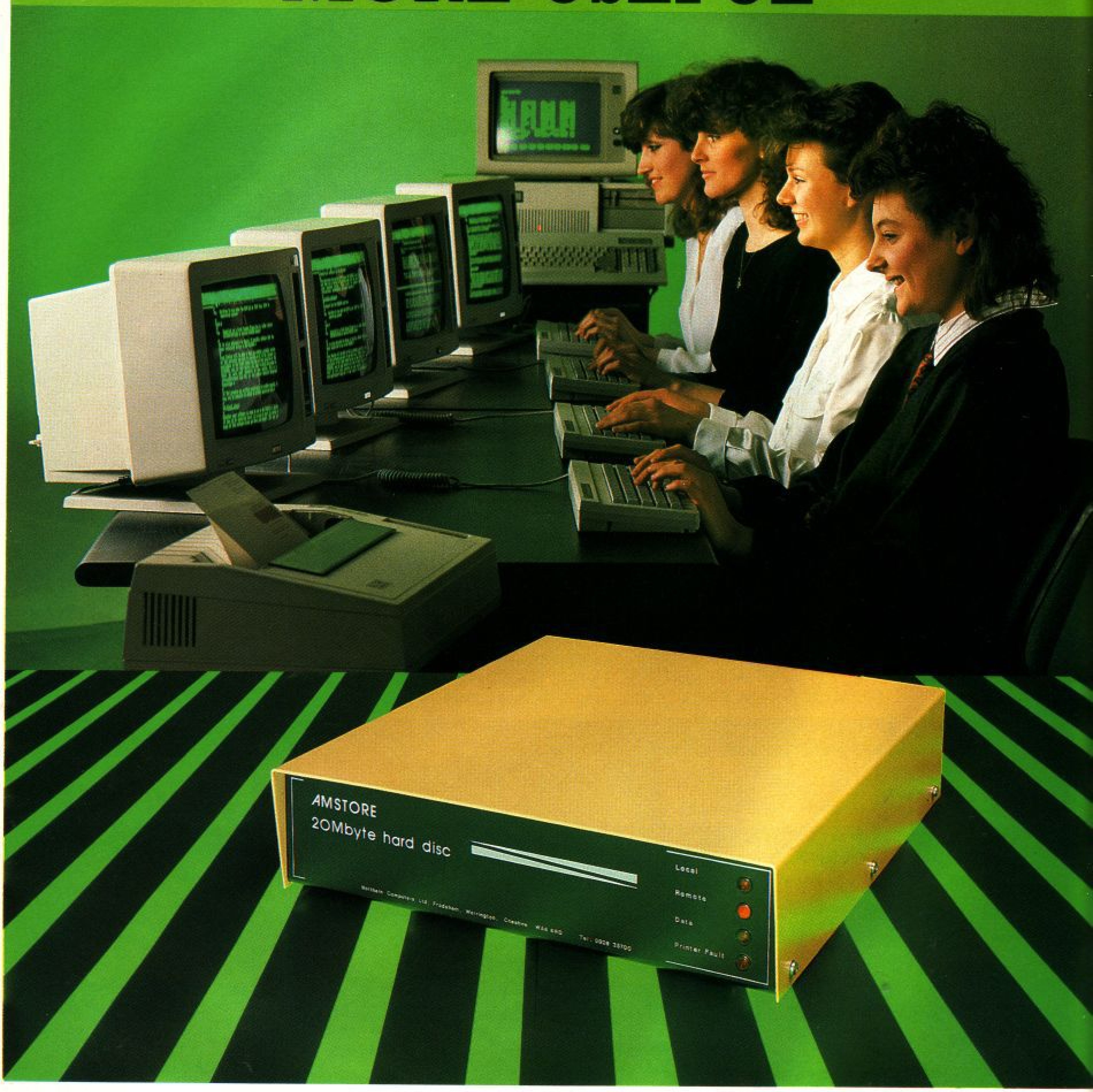
LocoScript: Hints & Tips

Win: Caxton Software



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Amstrad Business Computing

The City Page

The Amstrad bandwaggon rolls on. Turn back to the first mention of the PCW 8256 in these pages and at the end of the preview you will see that we suggested that readers should check the Amstrad share price after 12 months of the PCW 8256. At that time (just last September) it stood around 85p. At the time of writing it is around 345p. Amstrad computer news and reviews are now the hottest share tips in the business. Not bad for £1 a month, eh?

Whatever next?

The PCW 8256 is a hard act to follow. There are many attempts at guessing what Amstrad may have on the stocks for their next product. Having trodden the cautious route of one industry standard, CP/M 80, it seems fair to assume that another industry standard is in the sights of Roland Perry and his team.

The magic formula that has worked such wonders thus far could well carry on, since although the industry cynics (remember the carping comments about an "old fashioned" CP/M 80 machine at the launch of the PCW 8256?) will probably dismiss anything that treads a well-worn path, Amstrad has performed the task of preparing their marketplace with consummate skill.

A serious business

Amid the euphoria, don't forget that Amstrad have made the odd miscalculation here and there in the PCW 8256 project. There has been the serial interface fiasco, and despite Alan Sugar's dismissive remark that the interface was designed as a "pundit crusher" and that Amstrad would only sell a handful, any dealer of the machines will tell you that there are an awful lot of pundits out there just dying to be crushed.

The delightful communications software for the PCW 8256 has been starved of custom as a result of the delay in shipping the CPS 8256, and the wiser vendors have only been shipping the interfaces in packages with modems or printers. Users wanting to address external printers have been kept waiting, and the net result has been hassle all round.

If Amstrad are really so dismissive of anyone who regards the machine as anything more than a typewriter substitute, then maybe they could contract the task of "pundit crushing" to one of the brighter add-on support operations such as Pace – who would not only approach the subject with a better appreciation of the customers requirements, but also with the enthusiasm that is lacking in the term "pundit crushing".

Basic bargain

Precious few users of Basic appreciate just what a significant addition the Jetsam file manager on Locomotive's Mallard Basic really is. This ISAM (index sequential access manager) package turns Mallard into something akin to a database authoring system, although to read Locomotive's dismissively dry and laid back documentaiton, the wonder of it all might take a while to sink in.

If you are one of the many PCW 8256 users who has not yet fired up Mallard Basic to have a fiddle, you really are missing out. Most users can create their own database systems given a little persistence and patience – although the gruesome line editor is a definite turn-off to many programmers. Don't forget that NewWord or Wordstar has a non-document mode for program editing (saved using the Ascii save option), and that using NewWord's "Run a program" option, basic programs can be loaded and run "under" NewWord itself so that swapping in and out can be very quick.

Even the Joyce system disc offers an alternative in the form of RPED. It's true that the later versions of LocoScript have an Ascii ouput modem, but since you have to reload the operating system every time you want to edit, and then again to run Basic, this is not actually a practical proposition.

Spreadsheets

There are more spreadsheets available for the PCW 8256 than any other applications program. They all seem to have their own particular appeal, although only one has been really tailored to the hardware. ABC gave space to Ian Searle to describe his Cracker a few issues ago. As a result of the publicity, and the fact that Ian is the only native spreadsheet author, he was approached by one better informed educational authority with a wish list to turn Cracker into the sort of tool that would become a tool for science students.

So instead of boring old Basic the pupils could be taught how to apply computing, much as though a good old fashioned slide was used. Who cares how you print the ink on the wood, as long as it does what you want it to?

Ian Searle has continued to develop the Cracker Spreadsheet. The version Cracker2 now incorporates not only graphics, but XY graphs, date and timer functions, and an I/O control system with user patch area. You can thus use your PCW 8256 or CPC 6128 to control your central heating using this program, taking seasonal climactic variations into account. It hardly seems fair to call all this a spreadsheet.

William Poel

ABC REVIEW

A hands on experience with Joyce

LocoScript is more than just a freebie word processor which has been bundled with a computer to make it easier to sell, it is an advanced program, dedicated to the hardware. Mike Gerrard looks at some of the finer points.

The last article described some of LocoScript's features, and this time we'll concentrate on how some of those features work out in practice, though to begin with I'll confuse the issue and say that there's no such thing as LocoScript.

As with many professional programs, LocoScript is being revised and improved constantly, and at the time of writing I've seen four different versions – 1.0, 1.04, 1.1 and 1.2.

There may well be more, and you can tell which version you have because that's the number preceded by a v which appears on the loading screen as the disc is being read into the PCW.

These updates don't necessarily mean there's anything wrong with the earlier versions. Although Amsoft will replace the first version of LocoScript for you because a bug makes it difficult, although not impossible, to use page numbers, they are under no obligation to provide each and every customer with the later versions which contain one or two features additional to those described in the manual.

I know they'll be very sympathetic if you have a particular need for one of the added refinements, though, as my own and friends' dealings with them have shown.

Ascii and reprint

There have been two major improvements in version 1.2 of LocoScript. The first of these allows you to prepare an Ascii file from any of your LocoScript documents, which means that the text contained in a file stands independently from LocoScript and the file could be passed to a third party – a typesetter, say – who could work from it without needing to have a copy of LocoScript to interpret all the codes for him.

The second improvement allows you to print out selected pages from within a document – previously you had to print a document from the beginning, which if you only wanted a copy of page 37 was a nuisance.

Now when you select the printing option you will be asked if you want to print all pages or some pages of the chosen document, and the "some pages" option allows you to choose the page or sequence of consecutive pages that you want printed. The same applies if your printing has been interrupted through paper jamming or something similar, you can choose at which point you want to start reprinting.

But what of LocoScript generally? Initially the large number of options facing you at any one time seems very daunting, but you can make light work of them by using the menus. If you are an experienced word processor user you can start by learning to type the various style and emphasis codes directly into your text.

From the editing screen I'm currently on while writing this article, I know I can press the f3 key for an Emphasis menu



containing four options – underline, bold, double and reverse video. I can switch them on or off by calling up this menu and pressing the special [+] and [–] keys either side of the spacebar.

I could also call up the master menu containing all the options and set them from that, but by far the easiest way to set these choices is by typing the instruction direct into the text. If I want to start underlining I type [+]ul and the underlining starts, until I type [–]ul when I want to switch it off again.

If you want a word or character emphasised in bold, it's quicker and simpler to type [+]b, two key presses, than to press f3, move the cursor bar down to highlight bold, then press Enter to set the option.

If you learn to do this straight from the start perhaps calling up the master menu if you need to be reminded of the appropriate abbreviations for the codes, then you will soon make many of the function options redundant and LocoScript will become much more manageable.

Another reason for doing this is that some of the function options are rather illogically arranged. There is a last line marker, for instance, which tells both LocoScript and the printer that this line is the final one on the current page (saving you from having to fill the page up with blank lines till you get to the bottom).

However you don't reach this code by pressing f5, the Lines menu, but by pressing f6, the Pages menu. This has been done because it is an End of page marker, but to save you remembering which menu contains which options get into the habit at once of typing your instructions directly into the text.

Forming habits

In fact habit is very important in dealing with LocoScript. Before starting to print out a document get into the habit of pressing the PTR key before pressing the P key to start printing. This allows you to check the printer options. You can waste a lot of time and paper if you frequently begin printing with the wrong options set. Bad habits are hard to break, so try to pick up good ones with LocoScript from day one.

Your daily working habits are very important, and here the manual seems to have misled a few friends of mine in attempting to explain what it refers to as Start of day discs.

I must say that to me the manual seems clear, but I think for the benefit of people new to computers it should have quickly explained how LocoScript is fed into the PCW. Once you have inserted and loaded your disc containing LocoScript, then the program is in the computer's memory and you don't need to keep the disc in the disc drive for LocoScript to operate.



Some people were under the impression that you had to have a copy of the LocoScript program on each and every disc you planned to use, but this is certainly not the case and would be very uneconomic if it were, as LocoScript takes up about half the memory available on one side of a disc.

I'd suggest you should ignore the idea of Start of day discs, and simply load in LocoScript first thing (always use your back-up copy and keep the original somewhere safe) and then replace the disc with the disc (containing only files) that you want to work on that day.

The main virtue of Start of Day discs according to the manual is that they save you the trouble of swapping discs round, but as it take about 10 seconds at the most to change over discs I don't think this is too worrying.

At the other end of the day, don't forget to think about whether to take back up copies of the discs you've been working on. That's a decision for you alone to take, but don't automatically stick all your discs away without ever considering doing back-ups.

It isn't often that data gets destroyed, but you might easily erase the wrong file or accidentally wipe out all the files on a disc (it's just happened to someone I know who's been using word processors for years, so don't think it can't happen) so imagine how you'd feel if you did lose the data on a particular disc. Let that be your guideline as to whether you should take an extra copy of it or not.

Avoiding a full disc

While talking about the possibility of losing data, it's very important to understand how LocoScript works when it is saving a file to disc.

You might find that you run out of space on a disc when in theory you should still have plenty of memory available. If you're editing a file that is, say, 15k long and you have 16k of space left on the disc, you might think it's an easy matter to add a few pages to the file, just 2-3k, and save the new longer version of the file.

LocoScript doesn't work as simply as that. What it does, quite sensibly, is try to save the new version of the document before it destroys or moves into limbo the old version.

You would be pretty annoyed if it destroyed the old version first and then, due to some technical hitch, was unable to save the new version, leaving you with nothing. In order to do that it needs enough space on the disc to save the complete new version of a file, not just the few additions you may have made to it.

In the example given, if your file is now 18k long, there isn't room for it in the 16k available on the disc, so what LocoScript will do is save as much of it as possible and then ask you to create some space on the disc to allow it to save the rest.

Unfortunately you can't create the space by moving the old version of the file onto the RAM disc until the new version is saved. You have to erase or move another file.

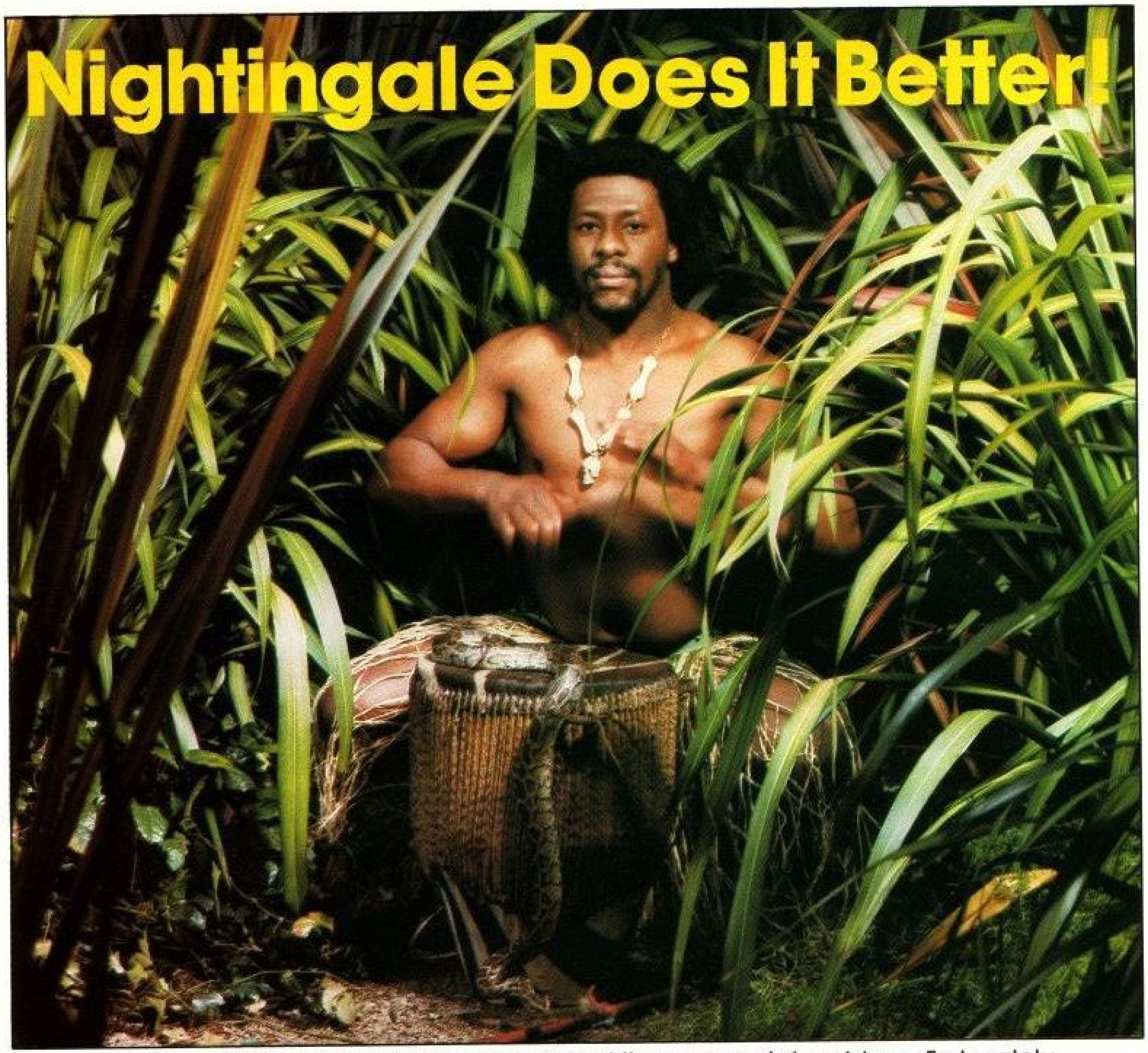
This is usually quite straightforward, though of course it's always risky moving any file into the RAM disc even for a short space of time. Sod's Law ensures that if you're going to get a power cut it will happen in those precious few seconds.

Depending on the size of the files you're dealing with, you might even have to move one on to another disc to create sufficient room to finish saving, and this is when you discover you have no room on any of your other discs and the only blank one available is unformatted. Avoid this by always keeping an eye on the memory remaining on a disc, and bear in mind that you might need twice as much as initially seems likely.

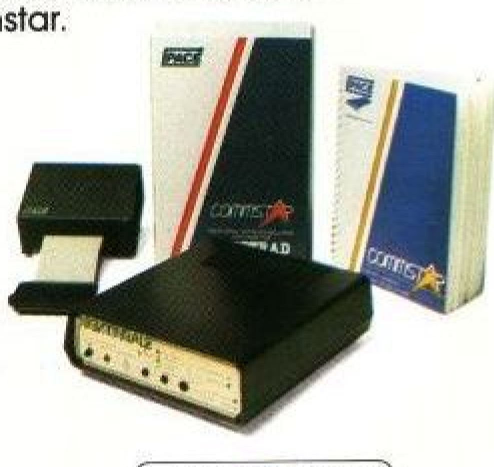
Short cuts make long delays

One habit you shouldn't get into is doing things the wrong way just because it seems simpler, or because you can't take the trouble to find out how to do something the right way.

One example could be in the various templates that LocoScript provides you with initially. Some might almost suit



Communicating with the outside world can present its own special problems. Fortunately help is at hand for Amstrad users in the form of Nightingale and Commstar.



The Nightingale modem has become the standard by which others are judged. Combining simplicity of use with true multi-baud rate operation, Nightingale can provide access to both Viewdata (1200/75 & 75/1200 baud) and full duplex (300/300 baud) systems.

Commstar is **the** communications software and is now available for the Amstrad micro. Commstar is a combination of powerful Viewdata and Terminal communications programs providing full telesoftware downloading facilities. It is fully approved by Viewfax and features window menus, a full eight colours, it can be used under C/PM and is fully compatible with the Amsoft RS232 standard.

Nightingale and Commstar for use on the Amstrad CPC 464, 664, and 6128 are available direct from Pace or from good dealers everywhere.

APPROVED for use with telecommunication systems run by British Telecommunications in accordance with the conditions in the instructions for use.
S/2592/3/E/500065

Nightingale Modem £119.00 Commstar on disc £29.57
Nightingale, Commstar (on ROM), plus Serial Interface £150.00

Also available separately are the Terminal (Honeyterm), and Viewdata (Honeyview) programs from Commstar at £19.95 each.

Please add carriage and V.A.T. to the above prices. P & P (U.K.): £0.75 with Nightingale £2.50.

Comprehensive fact sheets are available for these and other Pace products.

PACE

PACE Micro Technology
Juniper View, Allerton Road, Bradford, West Yorkshire.
Tel. 0274 488211 Telex No. 51338
Prestel Mailbox No. 274 729306
Telecom Gold Mailbox No. PCE 001
Int. Tel. No. +44 274 488211

Access VISA

Rated best Modem and Software by *Amstrad Computer User*


If you want to update
your office, here's a tip.

The electric typewriter's days are numbered.

Because now there's a machine that puts real wordprocessing power within everyone's reach.

The Amstrad PCW 8256 is a complete wordprocessor and a powerful computer in one unit.

And its unbelievably low price includes a screen with built-in disc drive, keyboard, printer and wordprocessing software.

It's a complete wordprocessor

The PCW 8256 is totally equipped for wordprocessing. It has a high resolution screen with 90 columns and 32 lines of text.

That's 40% more usable display area than most PC's.

There's a high speed RAM disc that allows you to store and retrieve information instantaneously, as you're creating a document.

There's also an optional combined serial and parallel interface that gives you access to modem, additional printers and other peripherals. And you can even add an extra 1 M byte drive.

Training

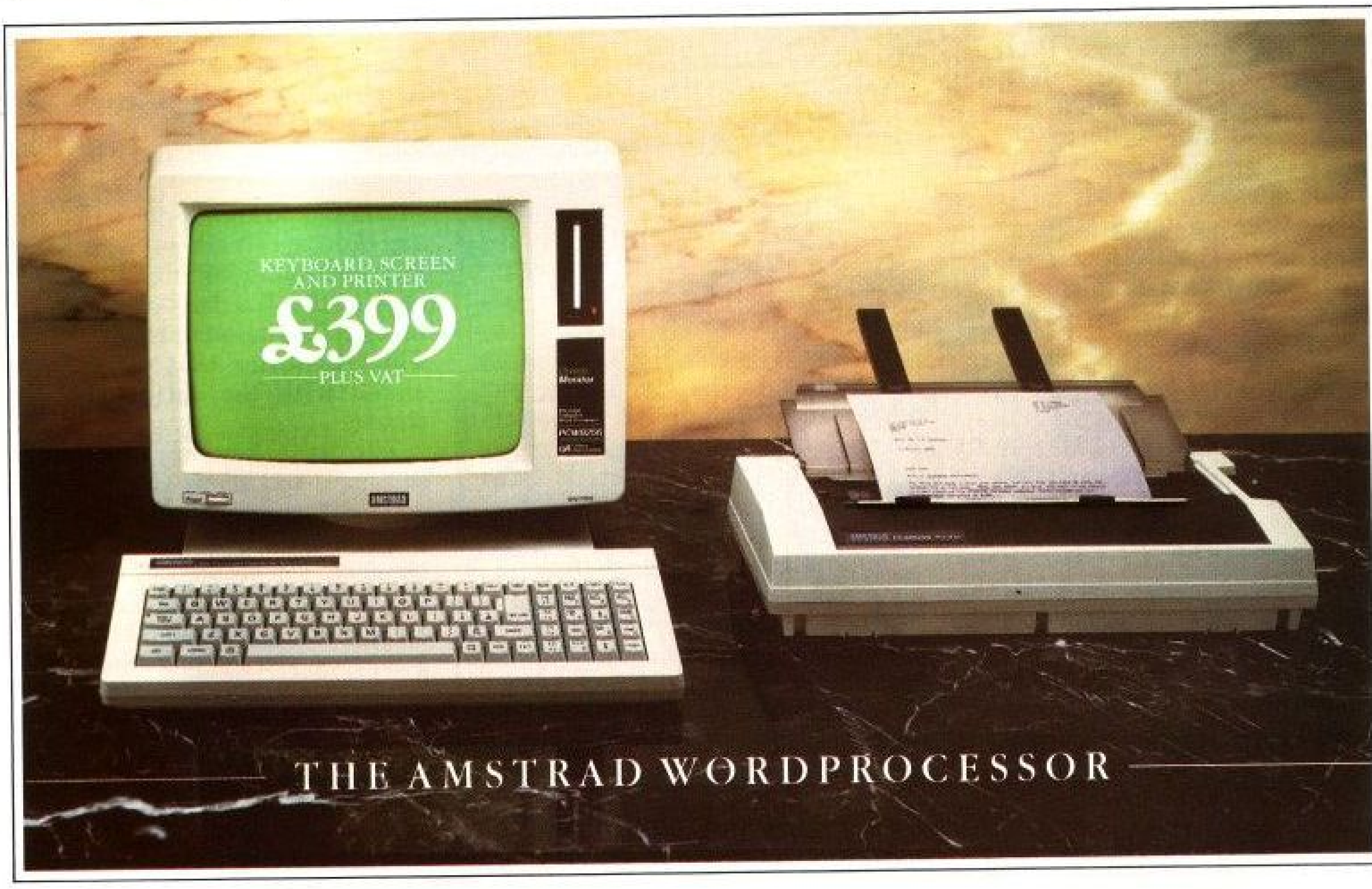
The PCW 8256 comes with a comprehensive user guide that tells you, in simple language, how to master its wordprocessing and computer capabilities.

But if you want to get to grips with it even quicker, there are now a great number of training courses available throughout the country.

On-site maintenance

Amstrad computers are exceptionally reliable.

But many business users find it reassuring to know that nationwide on-site service and maintenance contracts can be arranged.



The 82 key keyboard is specifically designed for wordprocessing. Its special function keys allow you to refer to 'pull down' menus as you work, so you don't have to memorise complicated codes.

And the PCW 8256 has an integrated printer with compatible software that gives you a choice of letter quality and high speed drafting capabilities.

Finally, there's an automatic paper load system, as well as tractor feed for continuous stationery.

It's a powerful computer

The PCW 8256 is also a purpose built computer with an enormous 256k memory.

For computer buffs, the Mallard basic, Dr Logo and GSX Graphics system extensions will mean you can write your own programs.

All of which puts the ordinary office typewriter firmly in its place.

The place featured on the opposite page.

Please send me some more information about the PCW 8256

Home user ☐ Office user ☐ (Please tick)

Name________

Address________

Tel:________

Company________

Amstrad PCW 8256

Amstrad, P.O. Box 462, Brentwood, Essex CM14 4EE.
Tel: (0277) 230222. ACU 4/86

METYCLEAN · OFFICE INTERNATIONAL · RONALD MARTIN · RYMANS · SANDHURST · THOMAS HILL · WILDINGS AND GOOD INDEPENDENT COMPUTER STORES.

your needs, so you adapt to using them rather than be bothered to find out how to amend them so they exactly suit your needs.

One of the templates, for instance, has a great number of tab settings, so you find it esier to press the Tab key several times to move you across the page of a document rather than try to edit the original template to delete some of the unwanted tab settings.

Because there are several different types of tab settings, you may feel it's going to be too confusing to learn how to set them and to learn what each one does, but if you think like that then you may as well go back to using a typewriter as you won't get the full benefit of your word processor.

The indent tab, for instance, is extremely useful, allowing you to indent a whole block of text to a particular point across the page while retaining the automatic word-wrap facility. Anyone interested in writing scripts would find this invaluable, and there will be lots of occasions where you'll want to prepare a document which has a section indented like that, and an indent tab is easily brought into effect by pressing ALT+TAB instead of TAB alone.

Headers and footers

One aspect of LocoScript that can be confusing, partly because it seems to operate differently from the way described in the early manuals, is the question of header and footer zone positions. If using single sheet paper the Amstrad allows for a maximum possible 70 lines of text on one A4 sheet.

Of this, the default settings that are in operation when you load LocoScript are for a header zone of nine lines and a footer zone of seven lines. This means that on any page the first nine lines will be blank, or with have whatever you choose to put as a header on each page, and the last seven lines will also be blank, or will contain whatever you choose to have at the foot of every page. The text of your document will appear on the 54 lines in-between.

These header and footer zones are very generous, and do give you a well spaced page with healthy margins all round, but if you want to squeeze more information on each page then don't be afraid to alter them to suit yourself – they're only suggested settings after all.

What you must be careful of, though, are the two settings marked position on the Page size menu, selectable from the options available when you're editing the header.

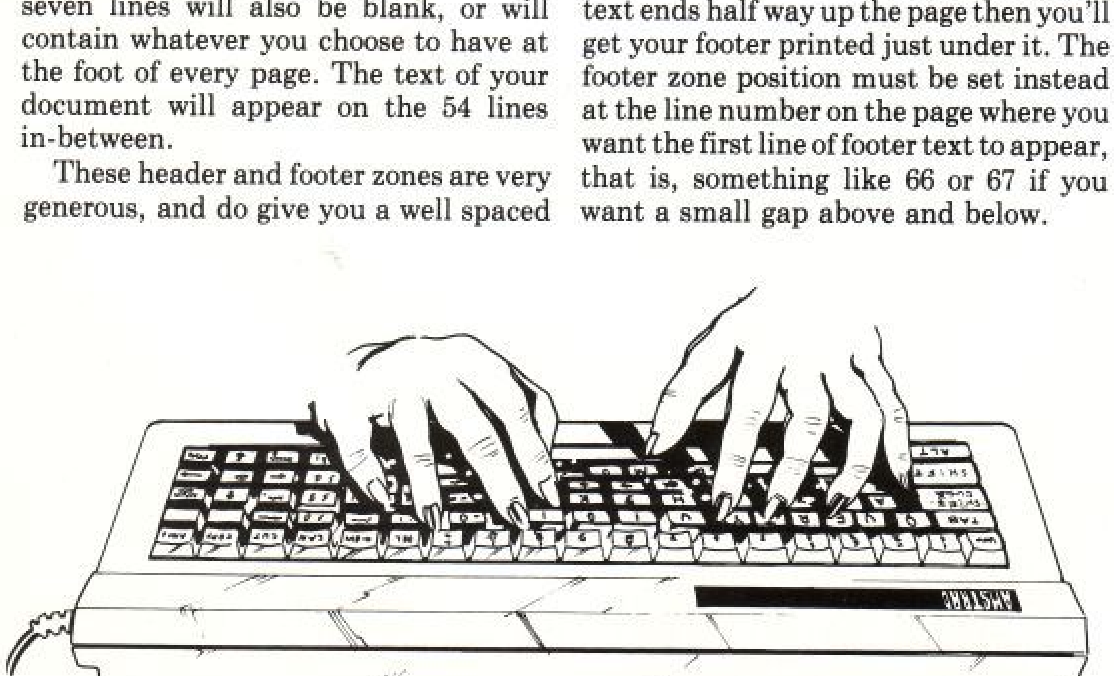
Although you have a zone of nine lines set aside for the header on each page, you're unlikely to want the header text to appear on the first line of that zone, right at the top of the page, so you select a position setting of perhaps 4 or 5 to indicate on which line of the page the first line of your header text will appear. If you have just one line of text, say a title and page number, this gives you a reasonable margin above and below it.

There is a problem with the footer zone position setting, however. This works in a similar way, and you use it to indicate where you wish the first line of your footer zone text to appear. Obviously you don't want it immediately after the last line of the document proper as it will look more like a continuation of it, so you'll probably want to leave at least a couple of blank lines before the footer is printed.

According to the manual the footer position is counted up from the bottom of the screen, so if you enter a setting of 3 the first line of your footer text will appear three lines up from the bottom of the page.

Unfortunately this doesn't seem to work in practice, and with a setting like that LocoScript will try to print the first line of footer text on the third line of the page, counting from the top. As this is occupied by text, it waits and prints the footer text as soon as possible after the body of the document.

If the text fills the page this doesn't matter too much, as the footer gets printed at the foot anyway, but if your text ends half way up the page then you'll get your footer printed just under it. The footer zone position must be set instead at the line number on the page where you want the first line of footer text to appear, that is, something like 66 or 67 if you want a small gap above and below.



You must also remember not to put more lines into the footer zone text than can actually be fitted on to the page. If your first line of text is to appear on line 67, and you then enter four lines of footer text, the final one won't fit on the page and will be carried over to be printed on the top of the next page.

If you are printing out a single sheet of paper this could cause the program to appear to lock up, and you won't be able to do anything with it, whereas all that's happening is that the document hasn't finished printing its final line of text and the machine is simply "Waiting for paper".

Stop!

In dealing with LocoScript in practice, I've been concentrating on items that the manual doesn't explain perhaps as well as it could, or on slightly confusing areas, and there's one important key that doesn't even appear in the index, which is the Stop key.

You should know by now that the Can key (for Cancel) allows you to take back any command or menu that you've decided that you don't want after all, and in effect it's the opposite to the Enter key which confirms that you want to go ahead with the action that you've chosen.

The Stop key works as an extra safeguard and allows you to halt certain actions if you change your mind. It won't work on every type of action, but if, for instance, you've pressed the wrong key and started to send the cursor to the end of the document instead of to the beginning, you can press Stop to prevent you having to sit there and watch while the cursor slowly but inexorably makes its way to the wrong place.

Pressing Stop at once calls a temporary halt to things, and you can either stop permanently by pressing Stop a second time, or carry on by pressing Enter.

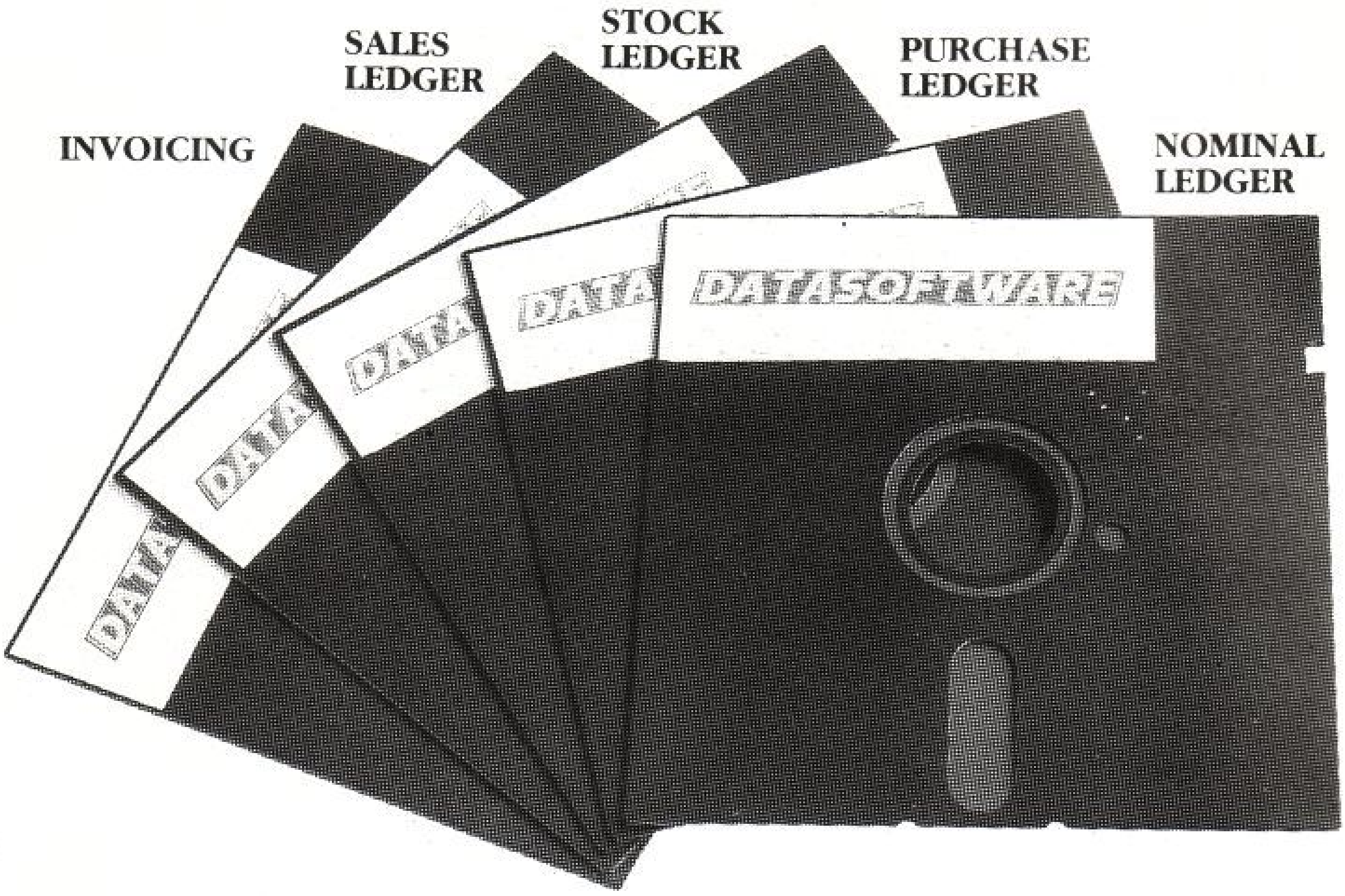
If you think you've made a mistake, it's always worth pressing Stop to see if you can get out of it again. It doesn't cancel the action, but merely halts it at the place it's reached and allows you to send the cursor back the other way or whatever it is you wish to do.

I hope this series of articles has served to explain Joyce a little more thoroughly to both those who've bought her and those who are thinking of buying the machine.

I said at the start that having spent my hard-earned money on the PCW, I felt justified in criticising where necessary, but in truth there have only been a few slight moans and I honestly feel it's the best buy I have ever made. It seems to have almost doubled my writing output, and you can hardly ask for much more than that.

ABC

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If any P.C.Soft module does not measure up to your expectations we will refund your money immediately.

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ABC SURVEY

Business computing: What did you want?

The survey in issue 1 of Amstrad Business Computing produced a stunning response. William Poel studied the forms.

The first ABC supplement carried a brief questionnaire designed to get readers to work out what it was they needed from their first encounter with computing in their businesses.

The resulting forms have been read – but not analysed by computer (shame!) – since the size of the sample and the wide ranging nature of the questionnaire made this very difficult. However, the trends were quite apparent, and prove the marketing philosophy of Amstrad is dead right . . .

Who?

The source of submissions would have brought a lump to the throat of politicians who specialise in empty rhetoric extolling the virtues of why every business in Britain should embrace the "new technology" and computerise in the National Interest.

Everything from fish and chip shops to accountants, via small manufacturing businesses and a goodly (Godly?) dose of the clergy sent in their outlines for consideration.

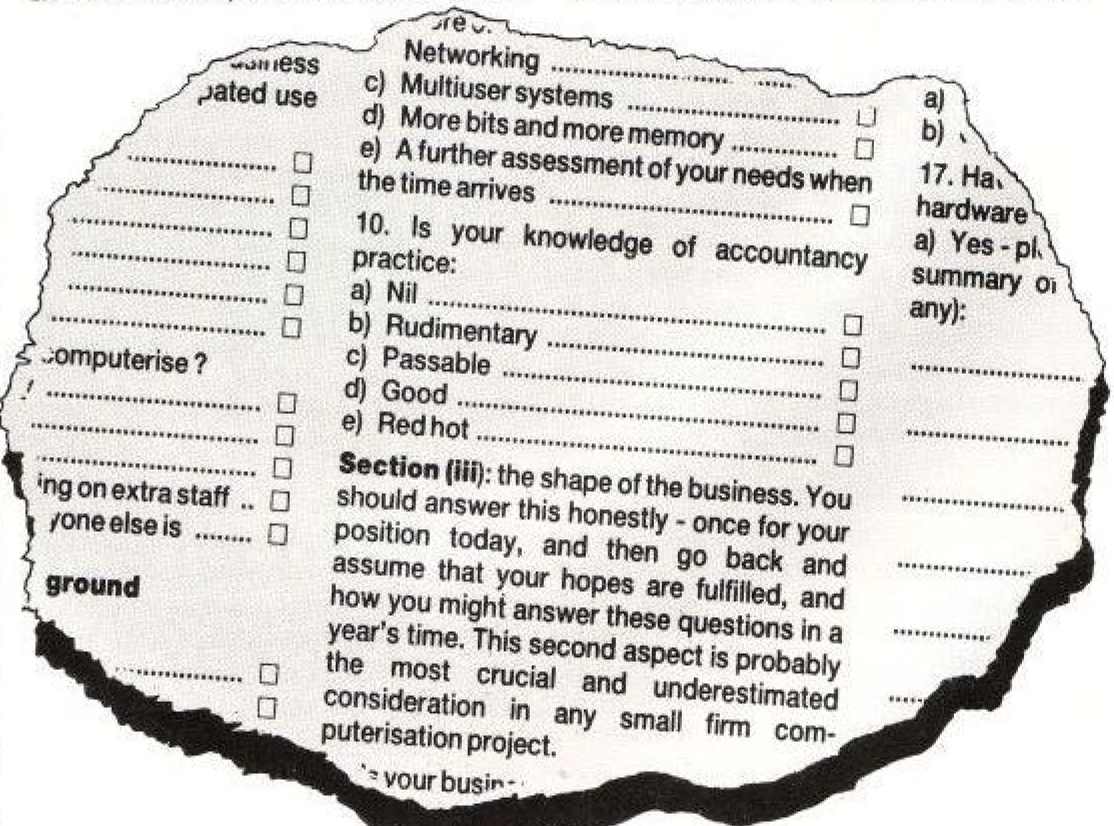
In other words, the heartland of Mrs Thatcher's enterprising community that steadfastly avoided the products of those other computer companies that featured heavily with the political PR, but who failed to address the needs of the small business.

What?

The number one subject (besides word-processing, taken for granted with a PCW 8256) was accounts. This is not surprising, but it is an area where a single disc PCW 8256 is at a disadvantage.

The main problem being that account data files need to be pre-set: and changing the size of accounts data files is a notoriously delicate task, if it is possible at all. So you must try and get it right first time. It isn't easy guessing how many customers you will have in 12 months time, how many stock lines, how many transactions.

Playing with only 173k of data leaves little or no room for guesswork, and makes the totally integrated approach of invoicing, stock control and sales ledger nearly impossible. Far better to start with the second drive fitted if accounts


Networking ....
c) Multiuser systems ....
d) More bits and more memory .... □
e) A further assessment of your needs when the time arrives .... □
10. Is your knowledge of accountancy practice:
a) Nil .... □
b) Rudimentary .... □
c) Passable .... □
d) Good .... □
e) Red hot .... □
Section (iii): the shape of the business. You should answer this honestly - once for your position today, and then go back and assume that your hopes are fulfilled, and how you might answer these questions in a year's time. This second aspect is probably the most crucial and underestimated consideration in any small firm computerisation project.

are going to feature in your requirements.

Around 80 per cent of the submissions confessed to have no prior knowledge of computers or computing, and were bravely setting out on the great quest for knowledge on their own. Not too many owners regard their encounter with the PCW 8256 as a "learning" experience – but I suspect that view will become modified after the first piece of software is purchased.

Spreadsheets and databases come joint second (no surprises here), and a few people added comments, declaring the high cost of Prestel and BT Gold to be a severe disincentive. Mind you, £1 a week is nothing when compared to the cost of the phone bill but most people seem to regard that quarterly event with a fatalistic indifference.

In any case, how many letters can you send for £1? And how many of those turn up next day? The "recorded delivery" E-Mail has been with us for years (telex), and it is a mystery why no one is trying harder to put together a low cost telex line interface for the PCW 8256. Hang all these modem mania, what the businessman needs is a real telex facility.

No messing about

A concise and clear cut attitude that computers are for computerising is fine: as long as the user is prepared to take a clinical view on the costs of acquiring knowledge, and actually add up the cost of their own and their staff's time spent in getting acquainted.

Anyone who does not count the cost is participating in a learning experience, whether or not they wish to call it that. This is why it is so important to make the right choices at the outset, and why the cheapest solution is not automatically the best solution. It may well only be the cheapest in the short term, turning out to be very much more expensive than other options in the medium or long term.

It was interesting to see that well over half the submissions claimed no prior knowledge of home computing either. Some (admittedly dubious) statistics seem to indicate that every man, woman and water vole in Great Britain owns a Spectrum (let alone anything else). I can only conclude that the experience has been so chastening that the owners have written off the idea of ever taking computing seriously where their livelihoods are at stake.

The cost

Following on from this point, when asked if the hardware, software or time spent learning was the most expensive element of the purchase, came a touching expectation that the highest price to be paid was for the hardware. Oh dear.

Virtually 100 per cent of users decided that they would make their minds up about the next stage in their development of computerisation based on their initial experiences. This is hardly surprising – and it will be interesting to re-ask the question in 12 months time.

The business outlook

Over 70 per cent of users claimed to have a passable or better knowledge of accountancy. It's inevitable for a small business to have to understand most aspects of accountancy these days, as the time spent in unpaid work on behalf of the government is probably the major driving force in the business computer industry. It seems likely that the most conscientious book keepers are likely to be those who perceive the most benefits from computerisation.

Almost everyone offered credit account facilities for their sales. next to the VAT return, the biggest moan in the small business is the chasing of unpaid debts, and the benefits of computerisation are very obvious on this score.

Stock control featured in 15 per cent of the forms. This is not a bad thing, since the rigours and discipline of stock management are rarely observed properly in small businesses, making a computerised record about as much use as a raffle.

Three people actually took any advice on the selection of their system, and one of those was a salesman from a multiple electrical retail chain. This says much for the power of Amstrad's message and promotional philosophy that "price is all".

Naturally enough, the three who took the advice rated it as "good". I only know of one or two of the thousands who bought a PCW 8256 to be disappointed – and that was almost entirely due to their fundamental meanness at refusing to buy a big enough system to match their immediate needs.

Conclusions

Those of you who sent in a form with an SAE may wonder why you have not received a direct response. I have dark and terrible confession to make. The forms and SAE's were detached, and since the form does not contain a name and address, and I'm not into handwriting analysis, I regret the only solution was to stuff as much general information into the envelopes as would fit, and return them.

The fundamental advice to all is to choose and use your accounting software in conjunction with your accountant (he may find it as much fun as you do), and under no circumstances stop keeping manual records until you are 100 per cent confident that you have a system that can recover from accidents such as power cuts.

There are now so many different software products available for the PCW 8256 owner that the prime considerations should be:

1. Is the author available to support the product? You'll either pay in the basic cost or with a paid support scheme. Expect to pay for this service. There ain't no such thing as a free lunch, and software publishers who don't charge enough go bust: then where do you stand? Arriving just as the Official Receiver is towing the sleek black Porsche away is not going to rescue your payroll system when the NI rates have changed (yet again).

2. Does the software have any upgrade path – in other words, if your business grows and you upgrade your hardware, will you be able to transport your knowledge and your data with you? Avoid cul-de-sac products where your knowledge is locked in to the PCW8256.

There's plenty around where counterparts exist on IBM PC, CP/M 86 etc that you have no excuse to remain shackled to machine-specific software.

The future for small business computing

The Sage Rent scheme is a good idea – as well as being a very shrewd piece of marketing in its own right by one of the most wily and experienced firms in the business. Dealers wishing to take a grip on their localities could do much worse than instigate similar ideas of their own, and users could do far worse than take up such ideas – especially where a dealer is able to offer a broad choice from the entire gamut of software available.

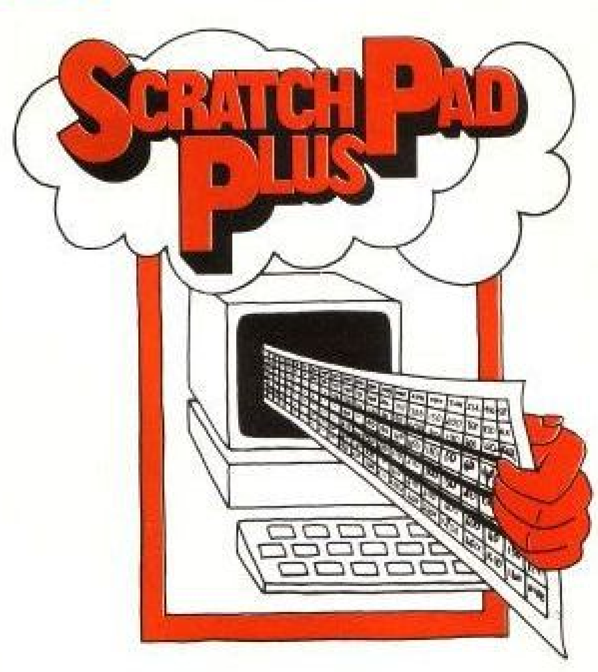
One drawback in such a scheme is the uncertainty of software warranties, and the scope for the awkward customer to wreak havoc with unreasonable demands for assistance. So far, PCW 8256 owners have shown themselves to be model customers *(that means they can go through the door we've fitted to the Joyce on the cover – Ed)*, being small business people who understand the reality of business better than the hobbyist consumer who is happy to spend hours on the phone to a software house trying to work out how to get past level 99 on Space Invaders.

As long as we all learn from the gradual decline of the plush carpeted, expensively equipped computer shops selling systems costing upwards of £5,000, and approach small business computing with a cautious realism on all fronts, then Amstrad will have done the economy a great service.

Too bad the government isn't interested in creating a climate where it would be viable for Amstrad to make the PCW 8256 in the UK. But on the other hand, just look what happened to those manufacturers who tried.

ABC

What puts the **Plus** in the **ScratchPad** spreadsheet?



ScratchPad Plus is an electronic spreadsheet available for the Amstrad PCW 8256 and CPC 6128 computers. But it's the **Plus** that makes **ScratchPad** the only choice for all professional electronic spreadsheet users.

It's the **Plus** that gives what others give...

Plus

CAPACITY....

ScratchPad Plus is the ONLY spreadsheet that does not have an "OUT OF MEMORY" message – It doesn't need one! Because **ScratchPad Plus** is the ONLY spreadsheet that carries on giving you working space when other spreadsheets completely run out of steam.

The power of Virtual Memory!

ScratchPad Plus utilizes "Virtual" memory. Just like any other spreadsheet, it begins by building your model in memory. But unlike any other spreadsheet, **ScratchPad Plus** does not stop when you have used all the memory space available – It then pretends your disk drive is extra memory, and uses the space available to carry on calculating for you.

Anyone doing any serious spreadsheet work will tell you just how frustrating it can be when there just isn't any room left to complete your calculations!

Now that **ScratchPad Plus** is available, a spreadsheet just isn't worth considering unless it uses Virtual Memory!

Plus

FEATURES...

Multiple windows

Most spreadsheet programs allow you to view two parts of your spreadsheet at the same time. **ScratchPad Plus** is the only spreadsheet which gives you almost unlimited screen splitting capabilities.

Simultaneously view as many parts of your spreadsheet as will fit on the screen at the same time – Ask "what if" questions and see ALL the answers you need presented before you!

Design the spreadsheet around your application – Not the other way round!

With other spreadsheets, the theoretical number of rows and columns you can have is FIXED. If you need less columns, but more rows – NO CAN DO! With **ScratchPad Plus**, you decide how many actual rows and columns you require.

Display Pounds (££££££) not Dollars ($$$$$)

Let's face it – We are not part of the United States of America. Our currency is English Pounds (£), not US Dollars ($$$$$). **ScratchPad Plus** allows you to display the good old "£" sign – SOME OTHER SPREADSHEETS DON'T.

Plus

HELP...

Instant help

ScratchPad Plus has a comprehensive, easy to follow, user guide and tutorial which takes you step by step through all the features of the product. And there is a comprehensive set of help screens available to you all the time you are working with a spreadsheet.

Help just a phone call away

Every user of any Caxton product is backed by a skilled telephone support team who use the products themselves every day. If you have a question about **ScratchPad Plus** that the manual does not answer for you, it doesn't matter where you purchased our program from – just dial (01) 379 6502. The people who publish the product will help.

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Soon we will be beginning our series of **ScratchPad Plus** training courses at our training centre in Covent Garden. Pick up the phone and ask for details of prices and dates.

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For a limited period only, we are supplying FREE with each copy of **ScratchPad Plus** one copy of SmartKey II – the very clever keyboard enhancer and macro facility which works with most CP/M software. Combined with **ScratchPad Plus**, SmartKey II will allow you to display windows, recalculate models, save files and print by just pressing ONE KEY!

And combine SmartKey II with other programs to take the tedium out of any regular keyboard work you have to do.

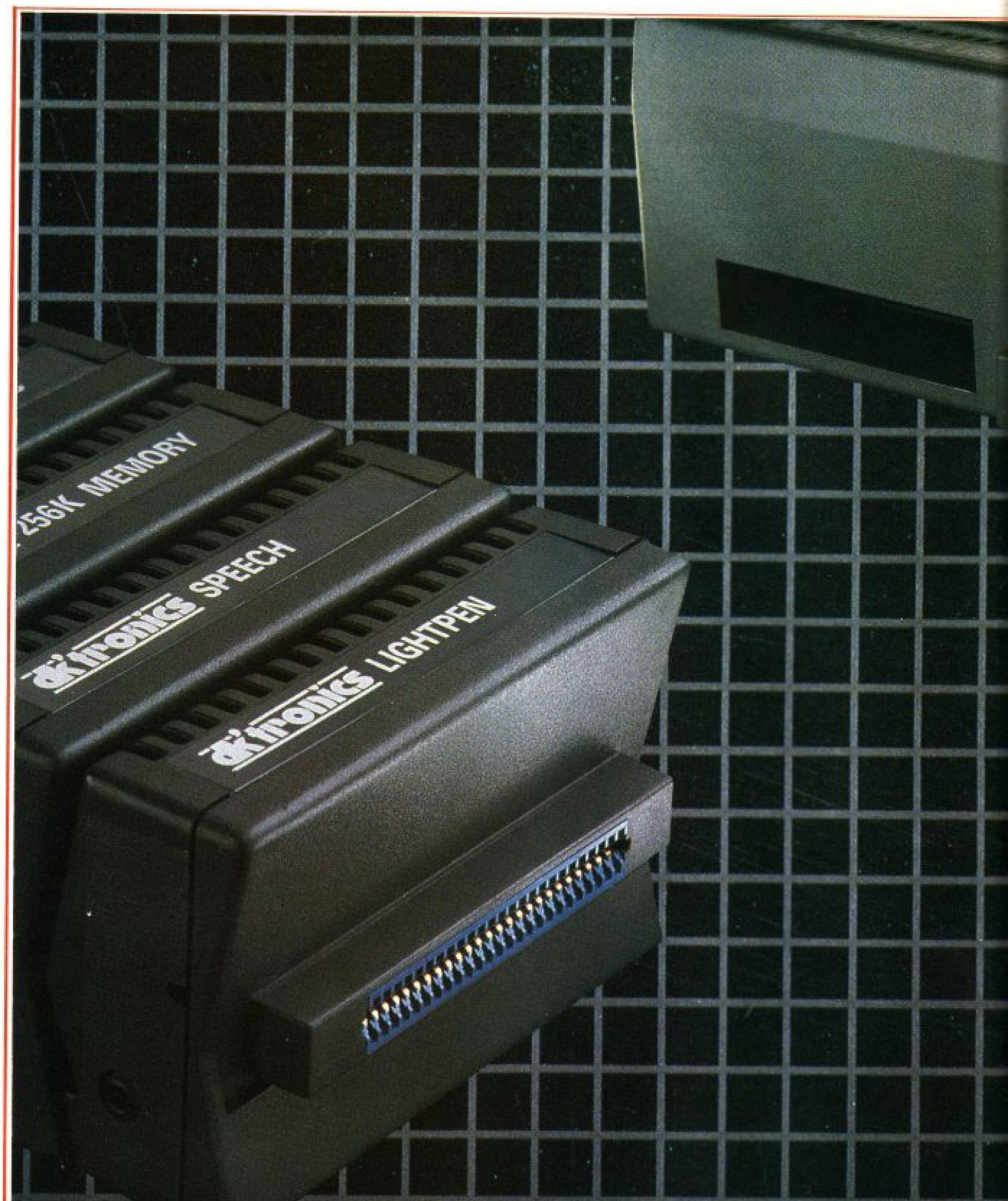
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A speech synthesiser and powerful stereo amplifier which greatly improves the quality of the internal speaker.

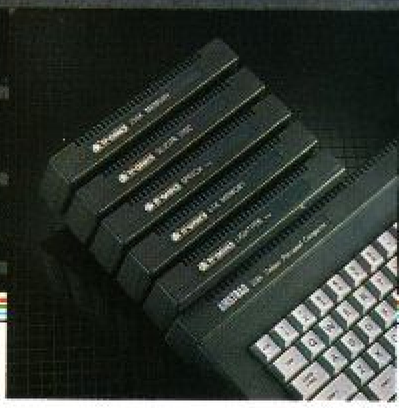
Extremely easy to use with an almost infinite vocabulary.

Supplied with text to speech convertor for ease of output creation.

Includes two high quality four inch speakers designed to compliment the Amstrad.

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Casette **£29.95.**
ROM **£39.95.**





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You can order by phone quoting your Barclaycard or Access number, orders are normally despatched in 24 hours.

YOUR AMSTRAD



64K Memory Expansion

Converts the 464 into a 6128 (except for the ROMS) and gives 128K of memory.

The 64K gives the same amount and configuration of RAM as the 6128.

It is supplied with bank switching software in the form of RSXs to use the second 64K RAM as storage for screens, windows, arrays and variables.

It allows the use of CPM plus as supplied with the 6128.

It requires no additional power supply.

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256K Memory Expansion

Converts the 464 into a 6128 (except for the ROMS) and gives a total memory of 320K.

Gives the same memory configuration as the 6128 but there are four extra banks of 64K.

It is supplied with bank switching software in the form of RSXs to use the memory as storage for screens, windows, arrays and variables. The 250K can store 16 full 16K screens.

It allows the use of CPM plus as supplied with the 6128.

It requires no added power supply.

£99.95.

256K Silicon Disc

256K of RAM disc accessible many times faster than the conventional drive and with a greater disc capacity.

It can be logged on as drive B or in a two drive system as drive C.

It will accept all normal Amstrad disc commands i.e. load, save, cat, etc.

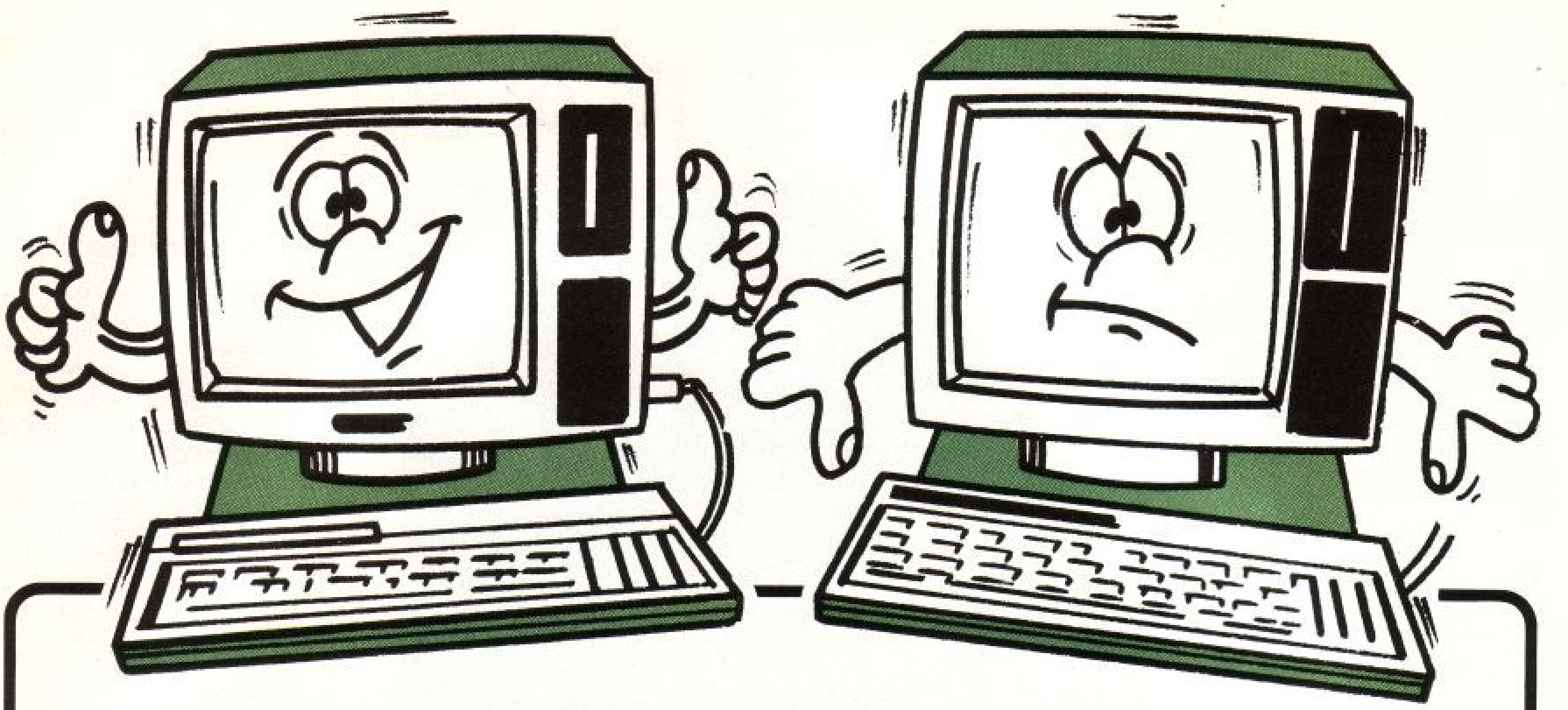
Data can be transferred onto the silicon disc from a normal disc or from RAM, application programmes can then work on the data at vastly increased speed.

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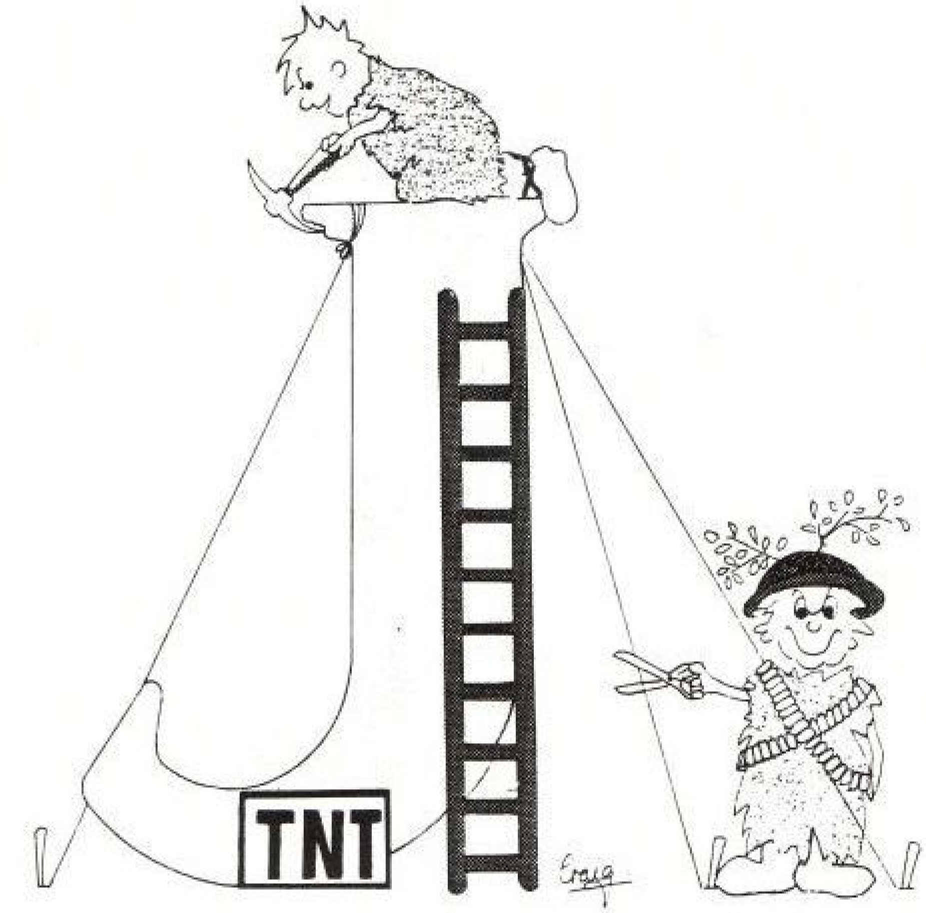
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Phone 0493 602926 (24 Hours), Telex 975408.



ABC

SPECIAL



Add character to your Joyce

Cliff Lawson, the man from Amstrad technical, returns to present part 13 in his awe inspiring series of articles on the socio-economic effect of pink jelly on a settlement of lesser spotted wood voles. In fact it's really something to do with redefining the Joyce character set (on screen, not printer, sorry!), but that doesn't sound half as interesting.

Before we go any further, I think I had better make it clear that the rest of this article is unlikely to take any prisoners. Some of the sentences are of a highly technical nature and should be avoided by anyone scared of the word PEEK.

Much to the protestations of the Editor, I think it has to be said that any normal thinking human being will prefer Sans-serif text to that used for setting this magazine. (Sans-serif means that the ends of the lines of letters don't have ostentatious twiddly bits).

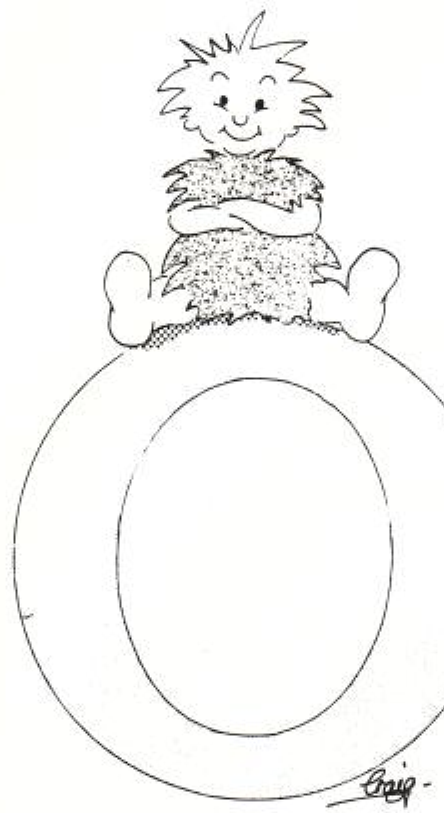
The eagle eyed among you may have noticed that your Joyce also has serifs on some of its characters and, as I don't like them, I figured that something needed to be done. The fruit of my labours is presented here, a simple (???) way to redefine the entire Joyce character set (or just selected characters).

When we sell you a Joyce, there probably aren't many people who realise that we also throw in several hundred pounds worth of software. Locoscript itself must be worth several hundred and in addition to this you get Mallard Basic (£100), GSX (£200ish), Dr Logo (£3.37), and Digital Research Programming tools (SID, ASM, MAC, RMAC, LINK) (another £200ish). So it seems like a good idea to make the most of this. The one drawback of the multiplicity of assemblers that we supply is that they are all Intel 8080, rather than Zilog Z80 assemblers, but this isn't really a major problem if your head is screwed on the right way (your nose should point in the same direction as you walk).

Mission possible

Your task, should you choose to accept it, is to type in the two assembler listings shown here. They must be entered into a couple of files on disc and by far the easiest way of doing this is to use RPED. If you have set your CP/M disc so that it has a PROFILE.SUB as described on page 15 of the CP/M section in Book 1, then just type the word RPED. Once the editor has loaded, hit f3 to create a new file. When asked for a name, type in either REDEFINE.ASM or DOIT.ASM, depending on whether you are typing in listing 1 or 2. The spacing in assembler programs is not exactly critical, but it does ease readability if there is a good sized space between each field of an instruction.

When you have typed in the file name, before hitting Return it would be a good



```
A>type text.txt
To be or not to be, that is the question
Whether 'tis nobler in the mind
To suffer the slings and arrows of outrageous fortune
Or to take arms against a sea of trouble and by opposing end them.
To die, to sleep no more and by a sleep to say we end the heartaches
And the thousand natural shocks that flesh is heir to.
'Tis a consummation. Devoutly to be wished.
To die, to sleep, to sleep, perchance to dream.
Ay, there's the rub. For in that sleep of death
What dreams may come when we have shuffled off this mortal coil
Must give us pause.
There's the respect that makes calamity of such long life.
```

```
A>type text.txt
To be or not to be, that is the question
Whether 'tis nobler in the mind
To suffer the slings and arrows of outrageous fortune
Or to take arms against a sea of trouble and by opposing end them.
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What dreams may come when we have shuffled off this mortal coil
Must give us pause.
There's the respect that makes calamity of such long life.
```

Top: With serifs. Bottom: Sans-serif

idea to remove your system disc and insert a formatted blank that has a bit more space on it.

Putting it all together

Having entered these two files, the fun really starts. They both have to be assembled then linked and finally combined. To do this, you will need to get your (back up of) side 3/4 disc out of his box. Remove the disc onto which you have just saved DOIT and REDEFINE and insert side 3 to the left. Then type:

RMAC B:DOIT

After a short pause, you will be prompted to insert the disc for drive B:. Remove side 3 and insert the disc with the two files on it. Once this operation has been successfully completed, you should be met by the following:

```
CP/M RMAC ASSEM 1.1
0251
000H USE FACTOR
END OF ASSEMBLY
```

If anything else appears, then this almost certainly means that you have made a typing error, so go back to RPED, to correct the file (DOIT.ASM).

Once the file has been successfully assembled, remove the disc and insert side 3 again. This time, type:

LINK B:DOIT

You will be asked to insert the disc for drive A:, just hit a key. You will then be asked to insert the disc for drive B:. Insert the disc with the assembler files and then hit a key. This should produce the following:

```
ABSOLUTE      0000
CODE SIZE     0251 (0100-0350)
DATA SIZE     0000
COMMON SIZE   0000
USE FACTOR      00
```

So far, so good, now you'll have to repeat the whole process for REDEFINE.ASM. Insert side 3 and type:

RMAC B:REDEFINE

Helpful hint: RMAC is on the disc for drive A: (side 3) and REDEFINE is on the disc for drive B: (disc with assembler files). Then type:

LINK B:REDEFINE [OP]

This will produce a file called REDEFINE.PRL, which is a page relocatable file containing a CP/M RSX. This must be renamed:

REN REDEFINE.RSX=REDEFINE.PRL

This must be added on to DOIT.COM using:

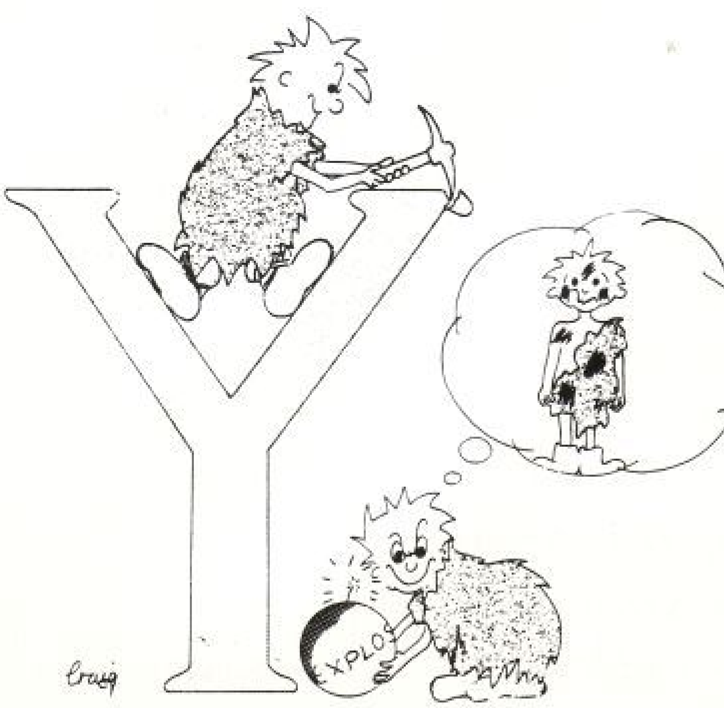
GENCOM B:DOIT B:REDEFINE

(GENCOM is on side 3).

If you understand all of that, you should now have a disc containing a file called DOIT.COM. With this disc in the drive, type:

DOIT

All being well, the character set will now



have been changed (for the better?).

If you cast your eye over the file called DOIT.ASM, you will see that the majority of lines in it take the form:

```
db        '?',nn,nn,nn,nn,nn,nn,nn,nn
```

Where the '?' is the character to be defined (this can also be given as a numeric character number 0..255). This is then followed by 8 bytes of bit significant data that define the 8 successive lines of dots that make up a character. Anyone who has ever met user defined symbols of any sort (such as on other Amstrads, Sinclairs and Acorns) will no doubt see the exact method of use for this. Basically, if you draw the character to be defined on an 8 by 8 grid, then convert each line in turn into a binary number, these can then be used in such a definition.

If DOIT.ASM is changed, then it will have to be assembled and linked again (you don't need to do REDEFINE.ASM again). Then the RSX has to be added using GENCOM just as before. Once this is done, the command DOIT will once again redefine the selected characters.

The more enterprising amongst you may be wondering just how this rabbit was pulled out of the hat. (If your not one of these then retire satisfied at this point because the going is about to get really tough).

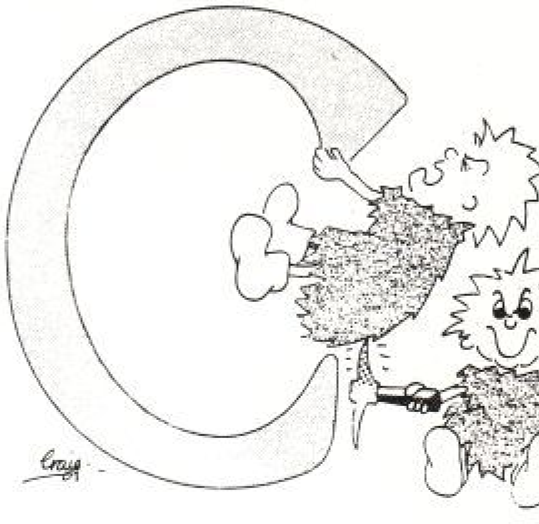
These programs demonstrate several useful lessons for the would be assembler programmer. Firstly it makes use of a CP/M RSX and therefore demonstrates how they are used.

In CP/M+, any modifications to the operation of the system can very easily be made using RSXs. I'll assume you already know what a BDOS call is. An RSX allows one to patch location 5 (the BDOS entry point) so that your external code can have a first look at the call being made before control is passed onto the original BDOS entry point. The beauty of this system is that these operating system modifications are contained within a relocatable module that can easily be attached to a .COM file so that it is able to make use of new BDOS calls or modified versions of the existing ones that can be used within a number of different driving programs. RSXs attached to a .COM file are loaded on page boundaries from the top of the TPA downwards. This gives a secondary benefit if a piece of code must reside in the common memory of plus (from#C000 to#FFFF), it need not be moved from an address at the lower end of the TPA to a fixed address at the top. Instead, CP/M+ will move it for you to an address that best suits it and will do any relocating needed into the bargain.

You may wonder why a piece of code would want to be in the top of memory in preference to being lower down. Well, the essence of operation of CP/M+ is that one bank (64k chunk) of memory contains the TPA while the rest of the CP/M and screen memory and so on are kept hidden within some other 64k chunk.

To communicate between TPA and screen memory, for instance when a character is to be printed, there must be a smallish piece of the memory shared between all banks so that values can be passed back and forth.

The 64k banks are really made up of four 16k blocks, one of which is common to all banks. There are various possible combinations used for the operation of CP/M. The BDOS bank is made up of blocks 7, 3, 1, 0, the TPA is 7, 6, 5, 4, there



is an extra combination of 7, ?, 8, ? and the screen environment is blocks 7, 2, 1, 0. Block 7 (the top 16k of TPA) is common to all these environments. The blocks contain the following:

0 BIOS extended jumpblock
1 Screen memory
2 Matrix RAM, roller RAM and some screen memory
3 BIOS and BDOS
4 Bottom 16k of TPA
5 Next 16k chunk of TPA
6 Third 16k chunk of TPA
7 Common – top of TPA plus switching code
8 CCP, hash tables and data buffers

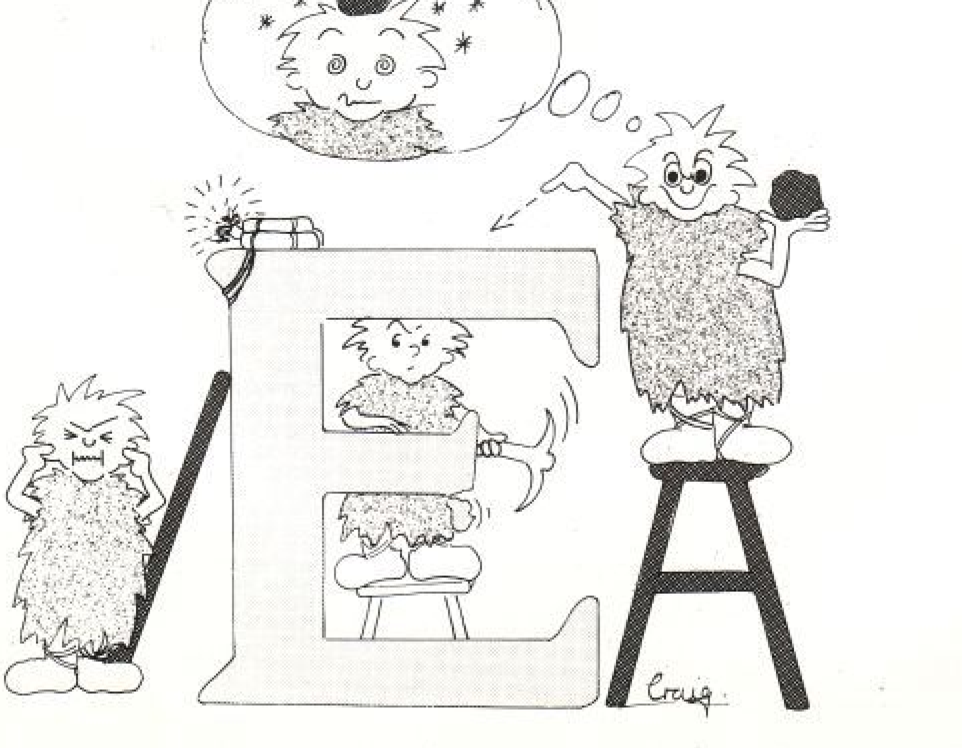
From within the TPA it is possible to call one of the extended BIOS routines in block 0 by calling the USERF entry in the BIOS. This is achieved by getting the address at location 1 (WBOOT) and adding an offset of 87. This gives the address of the USERF routine.

This value can then be stored following a 0C3h opcode (JMP instruction) to produce a simple routine that can be called (just like ENTERFIRMWARE in Amstrad CP/M 2.2). The call is followed by an inline address that is the address of the routine to call.

One particularly interesting routine is at address 000E9h, this is known as SCRRUNROUTINE and will allow the screen environment bank to be switched in, thus allowing access to the screen memory, the roller RAM and the character matrixes. The matrixes are held at 0B800h to 0BFFFh and the effect of the program is to update a particular group of eight bytes that constitute one particular character.

The actual position in this area is given by multiplying the characters value by 8 and adding this to the base address (0B800h). The area of memory from 0B600h to 0B7FFh holds what is known as the roller RAM, this contains 256 words each of which is the address of a pixel line on the screen. This can be used for rolling the screen.

If you didn't understand all that you'll be pleased to know that neither did I. A good look at the example program shown here will probably tell you a whole heap



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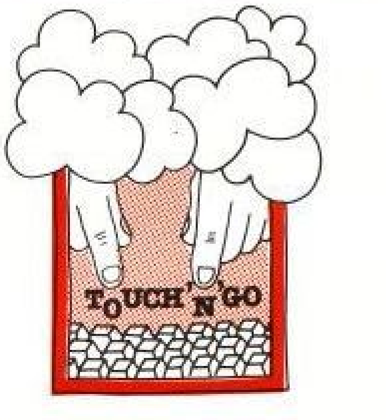
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```
***REDEFINE.ASM****

wboot           equu    1
charmat         equ     0b800h
scrrunroutine   equ     000e9h
        cseg
        db      0,0,0,0,0,0
        jmp     start
next:   db      0c3h
        dw      0
prev:   dw      0
remov:  db      0ffh
nbank:  db      0
        db      'NCHARSET'
loader: db      0
        db      0,0
start:
        mov     a,c
        cpi     73
        jz      begin
        jmp     next
begin:
        lxi     d,buffer
        lxi     b,9
        db      0edh,0b0h ;move parms to high mem before switch
        lhld    wboot
        lxi     d,87
        dad     d
        shld    cjfirm
        lxi     h,buffer
        lxi     b,code
        call    entfw
        dw      scrrunroutine
        ret
entfw:          db      0c3h
cjfirm:         dw      0
code:
        mov     a,m             ;get char number
        inx     h
        push    h
        mov     l,a
        mvi     h,0
        dad     h
        dad     h
        dad     h
        lxi     d,charmat
        dad     d
        push    h
        pop     d
        pop     h
        lxi     b,8
        db      0edh,0b0h       ; ldir
        ret
buffer:
        ds      10
        end
        lxi     h,table
        mvi     b,64
fred:
        mvi     c,73
        push    h
        push    b
        call    5
        pop     b
        pop     h
        lxi     d,9
        dad     d
        dcr     b
        jnz     fred
        rst     0
table:
        db      '0',038h,06Ch,0C6h,0C6h,0C6h,06Ch,038h,00
        db      '1',018h,038h,018h,018h,018h,018h,018h,00
        db      '2',03Ch,066h,06h,03Ch,060h,060h,07Eh,00
        db      '3',03Ch,066h,06h,01Ch,06h,066h,03Ch,00
        db      '4',01Ch,03Ch,06Ch,0CCh,0FEh,0Ch,0Ch,00
        db      '5',07Eh,060h,060h,07Ch,06h,066h,03Ch,00
        db      '6',03Ch,066h,060h,07Ch,066h,066h,03Ch,00
        db      '7',07Eh,06h,06h,0Ch,018h,018h,018h,00
        db      '8',03Ch,066h,066h,03Ch,066h,066h,03Ch,00
        db      '9',03Ch,066h,066h,03Eh,06h,066h,03Ch,00
        db      'A',03Ch,066h,066h,07Eh,066h,066h,066h,00
        db      'B',07Ch,066h,066h,07Ch,066h,066h,07Ch,00
        db      'C',03Ch,066h,0C0h,0C0h,0C0h,066h,03Ch,00
        db      'D',078h,06Ch,066h,066h,066h,06Ch,078h,00
        db      'E',07Eh,060h,060h,078h,060h,060h,07Eh,00
        db      'F',07Eh,060h,060h,078h,060h,060h,060h,00
        db      'G',03Ch,066h,0C0h,0C0h,0CEh,066h,03Ch,00
        db      'H',066h,066h,066h,07Eh,066h,066h,066h,00
        db      'I',07Eh,018h,018h,018h,018h,018h,07Eh,00
        db      'J',0Ch,0Ch,0Ch,0Ch,0CCh,0CCh,078h,00
        db      'K',066h,066h,06Ch,078h,06Ch,066h,066h,00
        db      'L',060h,060h,060h,060h,060h,060h,07Eh,00
        db      'M',06Ch,0FEh,0FEh,0D6h,0D6h,0C6h,0C6h,00
        db      'N',0C6h,0E6h,0F6h,0DEh,0CEh,0C6h,0C6h,00
        db      'O',07Ch,0C6h,0C6h,0C6h,0C6h,0C6h,07Ch,00
        db      'P',07Ch,066h,066h,07Ch,060h,060h,060h,00
        db      'Q',07Ch,0C6h,0C6h,0C6h,0DAh,0CCh,076h,00
        db      'R',07Ch,066h,066h,07Ch,06Ch,066h,066h,00
        db      'S',03Ch,066h,060h,03Ch,06h,066h,03Ch,00
        db      'T',07Eh,018h,018h,018h,018h,018h,018h,00
        db      'U',066h,066h,066h,066h,066h,066h,03Ch,00
        db      'V',066h,066h,066h,066h,066h,03Ch,018h,00
        db      'W',0C6h,0C6h,0C6h,0D6h,0FEh,0FEh,06Ch,00
        db      'X',0C6h,06Ch,038h,038h,06Ch,0C6h,0C6h,00
        db      'Y',066h,066h,066h,03Ch,018h,018h,018h,00
        db      'Z',0FEh,06h,0Ch,018h,030h,060h,0FEh,00
        db      'a',00h,00h,078h,0CCh,0CCh,0CCh,076h,00
        db      'b',060h,060h,07Ch,066h,066h,066h,07Ch,00
        db      'c',00h,00h,03Ch,066h,060h,066h,03Ch,00
        db      'd',0Ch,0Ch,07Ch,0CCh,0CCh,0CCh,074h,00
        db      'e',00h,00h,03Ch,066h,07Eh,060h,03Ch,00
        db      'f',03Ch,066h,060h,078h,060h,060h,060h,00
        db      'g',00h,00h,03Ch,066h,066h,03Eh,06h,03Ch
        db      'h',060h,060h,07ch,066h,066h,066h,066h,00
        db      'i',018h,00h,018h,018h,018h,018h,018h,00
        db      'j',06h,00h,06h,06h,06h,066h,066h,03Ch
        db      'k',060h,060h,066h,06Ch,078h,06Ch,066h,00
        db      'l',030h,030h,030h,030h,030h,036h,01Ch,00
        db      'm',00h,00h,06Ch,0FEh,0D6h,0D6h,0C6h,00
        db      'n',00h,00h,05Ch,066h,066h,066h,066h,00
        db      'o',00h,00h,03Ch,066h,066h,066h,03Ch,00
        db      'p',00h,00h,07Ch,066h,066h,07Ch,060h,060h
        db      'q',00h,00h,07Ch,0CCh,0CCh,07Ch,0Ch,0Eh
        db      'r',00h,00h,07Ch,066h,060h,060h,060h,00
        db      's',00h,00h,03Ch,060h,03Ch,06h,07Ch,00
        db      't',030h,030h,03Ch,030h,030h,036h,01Ch,00
        db      'u',00h,00h,066h,066h,066h,066h,03Ch,00
        db      'v',00h,00h,066h,066h,066h,03Ch,018h,00
        db      'w',00h,00h,0C6h,0D6h,0D6h,0FEh,06Ch,00
        db      'x',00h,00h,0C6h,06Ch,038h,06Ch,0C6h,00
        db      'y',00h,00h,066h,066h,066h,03Eh,06h,03Ch
        db      'z',00h,00h,07Eh,0Ch,018h,030h,07Eh,00
        db      '#',03ch,066h,060h,0f8h,060h,060h,07eh,00h
efw:            db      0c3h
hidihi:         dw      0
```

Listing 1: Redefine.ASM

more than a multitude of fatuous waffle.

REDEFINE.ASM contains the code to implement my RSX. This adds a new BDOS call (73, well why not?). The header information contained within the first 27 bytes at the top of this file will always be pretty similar whenever you want to implement a new RSX.

The first six bytes are always 0 and are filled when the RSX is loaded. The next three contain a jump instruction to the start of your interception routine. The following couple will be followed by the address of the previous module. This is the address to call if a BDOS function is required within the RSX.

This is followed by a single byte that should be OFFh if the RSX should be removed from memory next time the RSX is loaded and 000h if it should remain. An eight byte name will follow this. The loader flag indicates whether or not this is the last RSX in the chain. Finally there are a couple of bytes that are reserved.

```
cseg
lhld1
lxid,87
dadd
shldhidihi
callefw
dw0c2h
lxih,table
mvib,64
fred:
mvic,73
pushh
pushb
call5
popb
poph
lxid,9
dadd
dcrb
jnzfred
rst0
```

Listing 2: Do it.ASM

The first thing the RSX code should do is check the value in register C. If this contains the value of the BDOS call to be intercepted the routine is entered, otherwise control is passed to the next: routine.

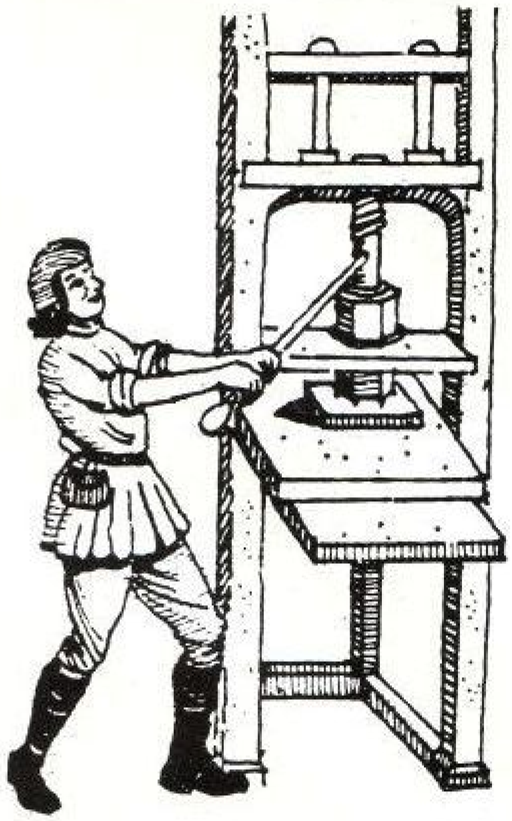
In this example the RSX intercepts BDOS call 73. If this is called the nine bytes pointed to by HL are moved into a buffer in common memory. The address of USERF is calculated and stored then used to access the SCRRUNROUTINE.

This calls a small section of program entitled code: which picks up the character number which is multiplied by 8 and added to the base address of the matrixes. Finally the new definition is moved into place with an LDIR operation accessed by a db in 8080 code.

Well, my good God, that was interesting wasn't it. I am sure we can all sleep a little sounder in our beds tonight, happy in this new found knowledge. Seriously though if that's possible, the above has shown how values can be moved from CP/Ms TPA into the bank containing the screen memory and so on so there is no longer any excuse for people not to produce some amazing graphic effects on the machine. Yeah, I know you were all just about to do it in GSX anyway.

ABC

The great Caxton give-away



The Amstrad PCW 8256 is much more than just a word processor. There are now many programs available which enable you to use it as a spreadsheet computer, database computer, ideas processor and so on.

Caxton software has become one of the leading suppliers of software for the PCW8256. This month they have donated one of each of their top selling programs to be used as a prize in our competition. The first correct entry will win a copy of Cardbox, Scratchpad plus, Brainstorm, Touch 'n' Go and SmartKey. This is a prize worth nearly £350. The five runners up will each win a copy of Touch 'n' Go.

All you have to do to enter this competition is answer the seven questions which appear below. To answer question seven simply telephone Caxton on 01-379 6502 and ask the name of the person on the end of the line. (The other end – Ed). The closing date for the competition is Tuesday, April 29. Good Luck.

The Questions

1. Caxton was the first English printer. What was his first name?
2. Caxton software use 'The Thinker' as a logo for the 'Brainstorm' ideas processor. Who sculpted 'The Thinker'?
3. Touch 'n' Go makes using any kind of typewriter keyboard easier. Who invented the typewriter?
4. All the Caxton software for Amstrad computers runs under CP/M. What does CP/M stand for?
5. What is the theoretical maximum number of records that can be stored using Cardbox?
6. What is special about the way Scratchpad uses its memory?
7. Name someone who works for Caxton.

Rules

1. Only one entry per person. You may photocopy the form, but anyone submitting more than one form will have all entries disqualified.
2. The judges' decision is final.
3. No employees of Amstrad, Amstrad User, nor their relatives or friends may enter.
4. Entries should be sent to: *Caxton Competition, Amstrad User, 169 Kings Road, Brentwood, Essex CM14 4EF.*

Answers

1. ____________________
2. ____________________
3. ____________________
4. ____________________
5. ____________________
6. ____________________
7. ____________________

Name ____________________

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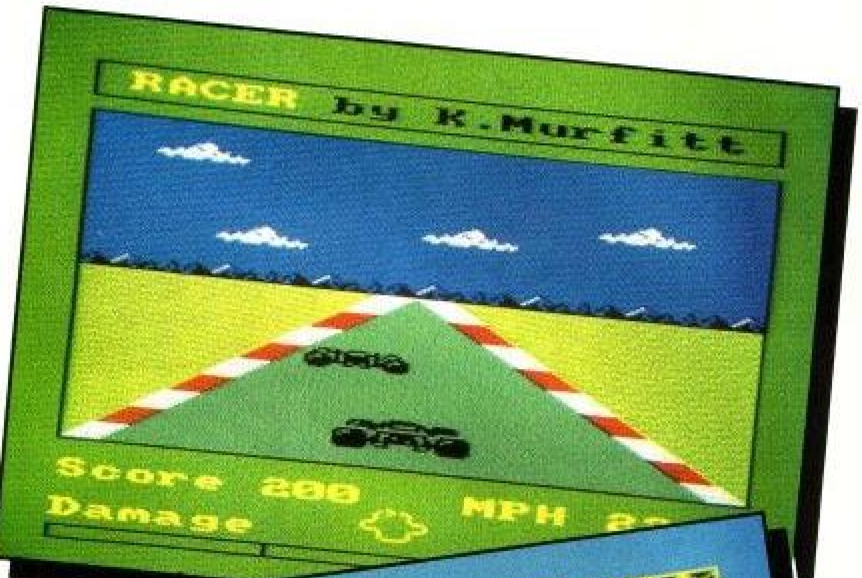
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ACU ADVERTISERS' BUSINESS INDEX

Amsoft's £2000 Software Competition

Competition time again. Lots of entries this month and of the usual high standard. There were some outstanding programs this time and of course they have scooped the prizes.







Galaxians Revenge, by K.N. Khalique of Batley, West Yorkshire, stood out as an excellent game suitable for publishing. It is a Space Invader type shoot-em-up. Nothing special about that you say. Okay, so it's not the most original idea, but an old idea presented well is still a playable and interesting game. All the ingredients were there, good colourful graphics, good sound effects, good response to the player.

The idea of the game, for those who have never seen Galaxians, is that alien invaders from another planet (the same one you've been on if you've ever seen Galaxians) are swooping down, dropping bombs on your laser cannon. You have the ability to move the laser cannon left and right to dodge the bombs and of course, fire back. When you have destroyed all the alien ships you get to meet the second wave, and so on.

Mr Khalique's game uses Basic, to do all the tricky stuff like taking one away from your lives, and then machine code to generate the sprites on the screen. The whole lot goes together in a neat little package that is just right.

Racer, by K. Murfitt, is a formula one motor racing simulator. Written entirely in Basic, it really shows what can be done without resorting to machine code. There are four circuits to choose from, some trickier with more bends, than others. The main part of the game shows you the rear of the car and the track ahead.

As you progress around the course you must overtake the opposition cars and avoid crashing into them. Corners must be taken at a safe speed or you will damage the car. Too much damage has the same effect as an outright crash, losing the game. Mr Murfitt uses ink switching to get the speeding track effect.

The third contender for our prize is Space Mania, written by Neil Kolban of Glasgow. Neil's game is a Jet Set Willy type of game, where the main charcter has to find his way around several screens of obstacles by running and jumping, left and right. We particularly like the catchy tune that continually plays through the game.

The final verdict of the judges is to award Neil Kolban £800, and K.N. Khalique and K. Murfitt £600 each.

Those people that didn't win needn't feel down-hearted. I often feel it's a real achievement to even finish a program. There is always the temptation to add a bit more and gild the lily. This is something that usually leads to poorly written and very long programs.

This can be avoided by doing 90 per cent of the work on paper. Planning your program and deciding exactly how it is going to look when it's finished is a worthwhile thing to do. Writing a program is a bit like making a model from a kit. If you start off by gluing bits together piecemeal you will end with a mess. If you sort out which bits go with which other bits and put them together in small assemblies. Then put all the small assemblies together, you will end with a much tidier result.

So get out those pencils and paper and let's see some really good entries this time.

GRAFIX NEWS

Amstrad musicians take up the baton ...

Having produced the best graphics software with light pen control, which has yet been seen on the Amstrad, the Electric Studio have commissioned the first light pen controlled Music Package, which also looks set to become the market leader.

The MUSIC BOX is available on cassette or disc and boasts an impressive list of features, which include:

464, 664 and 6128 compatible.
3 channel polyphonic sound.
Tone and volume Envelope Designer.*
Internal storage of approximately 8000 notes.
Print out of musical score.
Save score and envelopes to tape or disc.
Use envelopes in own program.
Any key or time signature.
Automatic bar line insertion.
Easy to use Icons with light pen control option.
Cursor music editor.
Share memory of channels in any combination.
Playback: Tempo: Key transposition: Octave.
Demonstration music included.

* The Envelope Designer uses the light pen to draw the graph of the envelopes — no numbers to enter. Sounds can be played while envelopes are edited.

The package can be controlled by either the ESP or DKtronics light pen; by joystick; or by cursor keys which will help all users get the full benefit from the various functions of the program.

THE PROGRAM WILL WORK WITHOUT A LIGHT PEN AND CAN BE PURCHASED SEPARATELY FOR USE WITH JOYSTICK OR KEYBOARD.

The MUSIC BOX is priced at £9.95 for the cassette program or £16.95 for the disc version and for a limited period the MUSIC BOX plus an ESP Light Pen will be available for the price of £19.95 with cassette software or £29.95 with disc based software.

Don't worry Joyce — you're not forgotten!

Final development work which will allow the ESP Light Pen to interface with the Amstrad 8256 "Joyce" machine, is now nearing completion at ESP's research and development facility. If you thought that people just go to sleep in Beds, then you'll be surprised at the activity taking place in Luton!

A simple to use graphics program, based on the successful format of the ESP range for Amstrad home computers, will soon be available which will transform your simple word processor into a graphically illuminating experience.

Many 8256 owners will need a graphics capability and should find the new Light Pen program an extremely useful work tool for their business or leisure use.

World First for British Company!

At a Press Conference held earlier this week, The Electric Studio announced the launch of the first ever, pixel accurate light pen for the Amstrad, for under £20.

This major breakthrough has been achieved through extensive development of their product since its introduction in September 1985, and is the culmination of months of work by the technical department.

The Technical Director of the company was quoted as saying "Up to now pixel accurate pens for freehand drawing were priced around the £40 mark. We can now produce a light pen capable of total accuracy, for a price that no other light pen manufacturer gets near."

The company confirmed that the ESP "PIXEL" Light Pen was available for £19.95 complete with the cassette software package that has proven to be the market leader.

They stressed that the accuracy would be available on both mono and colour monitors and the CPC 6128 machine specific program with freehand draw ability, will now retail at £29.95 with software on disc.

All future products, commencing with the "PIXEL" pen will be released with French, German and Spanish versions of both program and manual, as The Electric Studio recognises the importance of the European involvement with the Amstrad/Schneider range of computers.

Continued support for existing ESP users

Because of the launch of the new freehand drawing "PIXEL" pen, the Electric Studio will offer a special upgrade facility for existing users of the ESP character accurate Light Pen.

The Upgrade will provide modified pen and software which will transform the unit to a freehand drawing instrument, while the full graphics capabilities of the program remain the same.

Any owner of an ESP character accurate pen, whether in the UK or elsewhere can benefit from this offer by observing the following conditions:

All returns to The Electric Studio, PO Box 96, Luton LU3 2JP.

Cassette Software: Return the Light Pen only.

Disc Software: Return the Light Pen plus a disc and state type of computer.

Any user who has upgraded to a CPC 6128 computer since purchasing a Light Pen will be supplied with a 6128 program provided a blank disc accompanies the returned Light Pen.

Terms and Conditions of Upgrade:

a) The pen must be in working order.

b) Returned units should be mailed in protective packaging. i.e. Jiffy Bag or similar.

c) State clearly name, address and model of computer.

d) Enclose a cheque or P.O. for £5.00 for delivery within the U.K. or £7.00 for overseas delivery.

Electric Studio to support US Giant

6128 owners who have purchased or are considering the purchase of the Digital Research program DR Draw will be delighted by the news of the availability of an ESP Enhancement Pack.

This comprises a pixel accurate light pen with GSX driver on disc, which will allow total control of DR Draw using the light pen instead of cursor key controls.

The cursor is controlled by the light pen which gives almost instant access to all parts of the screen, making menu selection a much speedier process and thus giving additional flexibility to the overall package which is an invaluable time saver for the program user.

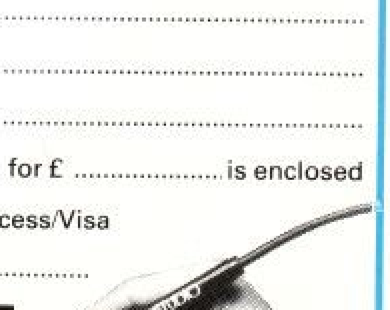
8256 users can look forward to a similar enhancement kit being available shortly.

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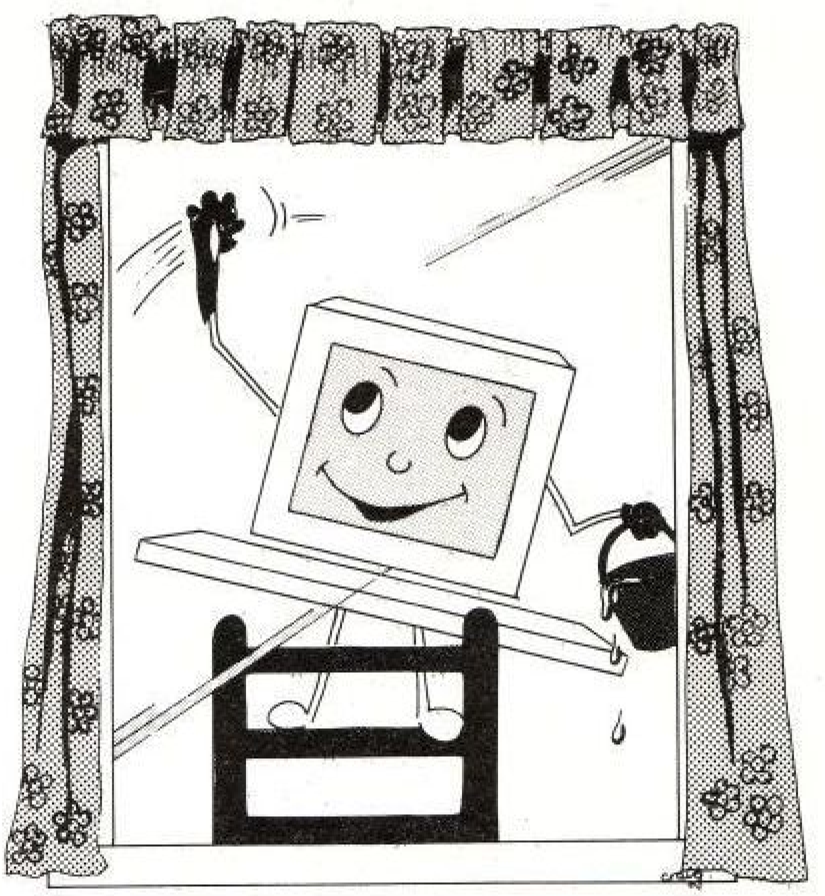


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Shutting the windows



Richard Sargent concludes his series on pull down windows.

Last month we looked at routines which read a character square (CALL &9000) and saved the information found there in user defined graphic number 255. There was also, on a larger scale, a routine which read a rectangular portion of the screen (CALL &90C0) and saved the information found there in RAM. The screen manipulation techniques in these routines require only a small amount of tweaking to enable them to be used as the basis for some interesting programs. This month we round off the series on windows by looking at a program which brings 'pull down menus' to the Amstrad.

Pull down menus

A pull down menu (PDM) is a panel of text, usually in the form of a list of options which can be called to the screen instantly. When you've finished with the menu the screen reverts to its original state. The pull down menu is generally recognised to be a good thing, and since it's part of the 16 bit micro revolution, no manufacturer of a new computer would want to be without some. However, memory restrictions, and, to a lesser extent, the lower screen resolution of the 8 bit micros has tended to exclude the pull down menu from the home micro scene, and unless you're lucky enough to own a mouse and some icon driven software to go with it, the chances are you won't have seen menus rolling down from the top of the Amstrad screen.

Using the software presented here, you can now incorporate pull down menus into your own program. Two extensions to the screen save routine are needed, but last month's code at &90C0-&9135 is substantially unchanged. Also, the area referred to as general RAM, in which parts of the screen are stored, is retained at &6D00-&8F20.

How then will the pull down menu system work? The menu must not destroy what's on the screen. A routine must therefore save that part of the screen where the menu is going to appear, and restore everything to normal afterwards. A pull down menu on the Amstrad CPC computers won't be as fast as those on the 16 and 32 bit machines, but there's no way around this problem other than to keep the menu reasonably small.

Sometimes it is useful if the pull down menu is available at all times, regardless of what task the computer is currently doing. If you want this feature, (it is optional) then the pull down menu code must be tied into the computer's interrupt system. This is done by a special piece of code called the interrupt service routine. Assuming you go for this fully fledged system of interrupt control, the sequence of events for the whole pull down menu program looks something like this:

1. The interrupt service routine is called every fiftieth of a second. It checks keys f1, f2, f3 and f4 to see if a menu needs to be "pulled down".
2. A screen segment is saved to general RAM at &6D00.
3. The menu is moved to VDU RAM.
4. The foreground program is now effectively frozen, and will do nothing. If the foreground program were allowed to continue (which is technically possible by altering the interrupt service routine program slightly) it might print data over the menu and destroy it!
5. The interrupt service routine now looks for key press f0, which will remove the menu.
6. The original screen segment is restored to VDU RAM.
7. The interrupt service routine is now finished, and the foreground program continues.

Some users might like to dispense with the interrupt arrangements. It is perfectly acceptable to use the same machine code routines to produce a pull down menu in response to a standard INPUT or INKEY$ command and such an application will be explained before the more complicated interrupt version is considered. When this more straightforward module is debugged and working satisfactorily the system can be transferred to interrupt control; but first, let's look at the pull down

```
100 REM M20.BAS PULL-DOWN-MENU DESIGNER
110 REM MEMORY &6CFF:LOAD "M20.BIN"
120 KEY DEF 15,0,32:KEY DEF 13,0,32:KEY DEF 14,0,32
130 KEY DEF 5,0,32:KEY DEF 20,0,32
140 WIPE=&91DB:CREATE=&9206:PPBASE=&9137
150 CLS:INPUT "MODE 1 OR 2";M:IF M<1 OR M>2 THEN GOTO 150
160 INPUT "DEPTH OF MENU 1 - 7 ";D
170 IF D<1 OR D>7 THEN GOTO 160
180 YB=(398-((D+2)*16))/2:E=D+1
190 MODE M:BORDER 9
200 IF M=2 THEN GOSUB 590
210 IF M=1 THEN GOSUB 630
220 LOCATE 1,D+3
230 PRINT " MENU 1                  ";
240 PRINT " MENU 2                  ";
250 IF M=1 THEN PRINT:GOTO 290
260 PRINT " MENU 3                  ";
270 PRINT " MENU 4"
280 PRINT
290 WINDOW #2,1,80,D+5,24
300 WINDOW 1,80,22,24
310 PRINT #2,"TYPE 1,2,3 OR 4 TO SELECT THE MENU-BOX  YOU WISH TO WORK ON."
320 PRINT #2,"YOU MAY TYPE INSIDE THE BOX AND USE THE <DEL> KEY,"
330 PRINT #2,"THE <ENTER> KEY TAKES YOU OUT OF THE BOX"
340 PRINT #2,"TYPE 10,20,30 OR 40 TO MOVE  A  BOX  TO THE MACHINE CODE PROGRAM"
350 PRINT #2,"TYPE 99 TO RETURN TO BASIC"
360 PRINT #2,"TYPE 88 TO SAVE TO TAPE OR DISC";
370 LOCATE 1,2
380 INPUT A
390 IF A=99 THEN MODE M:STOP
400 IF M=1 AND (A=3 OR A=4) THEN GOTO 380
410 IF M=1 AND (A=30 OR A=40) THEN GOTO 380
420 IF A=1 THEN WINDOW #1,2,19,2,E:GOTO 580
430 IF A=2 THEN WINDOW #1,22,39,2,E:GOTO 580
440 IF A=3 THEN WINDOW #1,42,59,2,E:GOTO 580
450 IF A=4 THEN WINDOW #1,62,79,2,E:GOTO 580
460 IF A=10 AND M=1 THEN ST=PPBASE+40:N=PPBASE+42:GOTO 540
470 IF A=10 AND M=2 THEN ST=PPBASE:N=PPBASE+2:GOTO 540
480 IF A=20 AND M=1 THEN ST=PPBASE+50:N=PPBASE+52:GOTO 540
490 IF A=20 AND M=2 THEN ST=PPBASE+10:N=PPBASE+12:GOTO 540
500 IF A=30 AND M=2 THEN ST=PPBASE+20:N=PPBASE+22:GOTO 540
510 IF A=40 AND M=2 THEN ST=PPBASE+30:N=PPBASE+32:GOTO 540
520 REM IF A=88 THEN SAVE "MTEXT.BIN",B,&78A0,5760
530 GOTO 380
540 POKE N,YB-(INT(YB/256)*256)
550 POKE N+1,INT(YB/256)
560 CALL CREATE,ST:GOTO 380
570 :
580 CLS #1:LINE INPUT #1,;"",A$:GOTO 380
590 FOR X=3 TO 656 STEP 160
600 PLOT X,392:GOSUB 620:NEXT
610 RETURN
620 DRAWR 152,0:DRAWR 0,-16*e:DRAWR -152,0:DRAWR 0,16*e:RETURN
630 PLOT 3,392:GOSUB 640:PLOT 322,392:GOSUB 640:RETURN
640 DRAWR 315,0:DRAWR 0,-16*e:DRAWR -315,0:DRAWR 0,16*e:RETURN
```

Listing 1

menu designer, which is a straightforward Basic program.

Type in Listing 1(M20.BAS), complete with the REM statements. When the Basic has been loaded, type RUN and in answer to the prompt "MODE 1 OR 2?" type 2, and to the prompt "Depth of menu 1-7?" type 7. The menu designer will appear on the screen, and by following the instructions given, one or more menus can be written.

You should experiment with various depths of menu in both modes 1 and 2 to get the feel of the designer. The editing facilities are somewhat limited and you need to remember to avoid the natural reflex of pressing the Enter key to go down a line while in the process of typing the menu contents. Once you have taken the cursor outside the menu box (which is achieved by pressing Enter) you can't get back in. You may use the arrow keys to move the cursor around inside the menu box.

The largest pull down menu which can be designed is 18 characters wide and 7 lines deep. There is always a border around the text, so in fact the total area of the pull down menu is 20 columns by 9 rows. The border is drawn by the subroutine at lines 590-640, using a value of E computed in line 180. E is simply the depth of the menu (D) plus one. Either line 200 or line 210 calls the relevant border drawing routine, depending on which screen mode has been selected. A more important task of line 180 is to inform the machine code routine which pixel line represents the bottom of the menu:

YB=(398–((D+2)*16))/2

Lines 220-370 are general prompt messages, while lines 380-530 deal with the options of design, create, and save menu. Lines 540-560 pass critical information about the size and number of the menu to the pull down menu machine code. CALL CREATE, ST creates a pull down menu. This code should be protected by a REM until the machine code is loaded, otherwise the computer will crash. Line 580 is the entire pull down menu editor and is essentially a LINE INPUT command acting on a specified window.

Pull down menu machine code

The pull down menu system works independently of the Basic designer, and occupies &1F6 bytes of code. Unfortunately, the storage area required for the four menus brings the total number of bytes required up to &25B5, but there's not much you can do about this factor unless you have a 6128 or a memory extension pack and are also happy about paging in the extra banks of RAM at machine code level. The source listing (Listing 2) of the pull down menu code is given in full so that hardy programmers can convert the code to handle menus which are stored in the alternate 64k RAM. At this stage the protective REM at line 560 should be removed from the designer program, and the loader program (listing 3) used to load the machine code bytes. The designer can then be RUN again and an experimental menu 1 and menu 2 created (the screen mode you use doesn't matter). Then the machine code can be put to work.

The first place to start investigating the code is at &9206, the create routine. This routine receives the variable ST from the Basic menu designer and immediately transfers the value into the HL register. HL now points to one of six tables. Let's assume for the sake of argument that the value of ST was such as to point HL at the table M2B1A at &9137. M2B1 simply stands for Mode 2, menu block 1. It's a data table of five numbers and it specifies the size and position of Menu 1 on a Mode 2 screen. M2B1A holds the address where pull down Menu I will be stored when it's created.

The pull down Menu 1 coordinates then follow – M2B1YB holds the bottom pixel coordinate of the Y axis, M2B1YT holds the top of the Y axis, M2B1XL holds X axis left, and M2B1XR holds X axis right.

The create routine moves these 10 bytes of M2B1 information into a special holding area labelled PP.

We are now almost ready to move the newly created menu from the screen into general RAM. A quick call to ROM establishes the screen mode, and this is placed in the B register. The direction of transfer of information is from VDU RAM to general RAM, so register C is set to 0. With PP, reg B and reg C now all valid, the general purpose routine MV_IT can be used to move the necessary bytes and so create the menu.

A quick look at MV_IT at &90D5 now revals what is happening . MV_IT is simply part of last month's code, where it was used in support of the Basic command CALL &90C0,D,XR,XL,YT,YB,ADDR. Now at this point I would normally say that those readers following

```
        LIST
;M20.ASM PULL DOWN MENUS ON COMMAND
        ORG &90C0
SIZE    EQU 1440
M5      EQU &6000
PDMP    EQU M5+2880
PP      EQU PDMP+84
M1      EQU PP+12
M3      EQU M1+1440
M2      EQU M3+1440
M4      EQU M2+1440
FAREA   EQU M4+1440
;CODE FOR CALL &90C0,D,XR,XL,YT,YB,ADDR
;D=0 screen to RAM
;D=1 RAM to screen
SCRMV   LD C,(IX+10)
XCREAT  LD B,12
        LD HL,PP
XCL     LD A,(IX+0)
        LD (HL),A
        INC IX
        INC HL
        DJNZ XCL
        CALL &BC11;SCR GET MODE
        LD B,A
;and fall thru to MV_IT
;CODE FOR SCREEN/VDU RAM TRANSFER
MV_IT   LD A,(PP)
        LD L,A
        LD A,(PP+1)
        LD H,A
        PUSH HL
        POP IX
        LD A,(PP+8)
        LD E,A
        LD A,(PP+9)
        LD D,A
MV1     LD A,(PP+7)
        SUB D
        RET C
        JR NZ,MV6
        LD A,(PP+6)
        SUB E
        RET C
MV6     LD A,(PP+4)
        LD L,A
        LD A,(PP+5)
        LD H,A
MV2     PUSH HL
        PUSH BC
        PUSH DE
        CALL &BC1D;SCR DOT POS
        POP DE
        POP BC
        BIT 0,C
        JR Z,MV4
        LD A,(IX+0)
        LD (HL),A
        JR MV5
MV4     LD A,(HL)
        LD (IX+0),A
MV5     INC IX
        POP HL
        DEC HL
        LD A,(PP+3)
        CP H
        JR NZ,MV2
        LD A,(PP+2)
        CP L
        JR NZ,MV2
        LD A,B
        INC DE
        CP 0
        JR Z,MV1
        INC DE
        INC DE
        INC DE
        CP 1
        JR Z,MV1
        INC DE
        INC DE
        INC DE
        INC DE
        JR MV1
        NOP
        NOP
;NOW THE CODE TO DEAL WITH HANDLING
;THE SCREEN MATERIAL UNDER THE
;PROPOSED MENU
;DATA AREA
M2B1A   DW M1
M2B1YB  DW 128
M2B1YT  DW 199
M2B1XL  DW 159
M2B1XR  DW 0
M2B2A   DW M2
M2B2YB  DW 128
M2B2YT  DW 199
M2B2XL  DW 319
M2B2XR  DW 160
M2B3A   DW M3
M2B3YB  DW 128
M2B3YT  DW 199
M2B3XL  DW 479
M2B3XR  DW 320
M2B4A   DW M4
M2B4YB  DW 128
M2B4YT  DW 199
M2B4XL  DW 639
M2B4XR  DW 480
M1B1A   DW M1
M1B1YB  DW 128
M1B1YT  DW 199
M1B1XL  DW 159
M1B1XR  DW 0
M1B2A   DW M2
M1B2YB  DW 128
M1B2YT  DW 199
M1B2XL  DW 319
M1B2XR  DW 160
STATUS  DW 0
;ENTRY POINTS ARE B1,B2,B3,B4
B1      CALL &BC11
        DEC A
        JR Z,M1B1
M2B1    LD HL,M2B1A
        JR PDM
M1B1    LD HL,M1B1A
        JR PDM
B2      CALL &BC11
        DEC A
        JR Z,M1B2
M2B2    LD HL,M2B2A
        JR PDM
M1B2    LD HL,M1B2A
        JR PDM
B3      LD HL,M2B3A
        JR PDM
B4      LD HL,M2B4A
;P (parameter storage area) is now
;overwritten using data from table
;pointed to by HL
PDM     LD DE,PP
        LD BC,(STATUS)
        XOR A
        OR B
        OR C
        RET NZ;PDM ALREADY ON SCREEN!
        LD (STATUS),HL
        PUSH DE
        POP IX
        LD BC,10
        LDIR
;PULL DOWN THE MENU
        CALL &BC11
        LD B,A
;SAVE WHICHEVER BLOCK (1-4) NEEDS SAVING
        LD L,(IX+0)
        LD H,(IX+1)
        PUSH HL
;RELOAD P+0,P+1 WITH M5
        LD HL,M5
        LD (IX+0),L
        LD (IX+1),H
;AND SO SAVE TO M5
        LD C,0
        CALL MV_IT
;RECOVER HL RELOAD TO P+0,P+1
        POP HL
        LD A,L
        LD (PP),A
        LD A,H
        LD (PP+1),A
        LD C,1
        CALL MV_IT
        RET
;ERASE A PDM FROM THE SCREEN AND
;RESTORE ORIGINAL SCREEN
WIPE    LD DE,PP
        PUSH DE
        POP IX
        LD HL,(STATUS)
        XOR A
        OR L
        OR H
        RET Z;NO PDM PRESENT!
        LD BC,10
        LDIR
;PULL IT UP
        CALL &BC11
        LD B,A
;LOAD P+0,P+1 WITH M5
        LD HL,M5
        LD (IX+0),L
        LD (IX+1),H
;RECALL SCREEN FROM M5
        LD C,1
        CALL MV_IT
        LD HL,0
        LD (STATUS),HL
        RET
CREATE  EX DE,HL
        LD DE,PP
        LD BC,10
        LDIR
        CALL &BC11
        LD B,A
        LD C,0
        CALL MV_IT
        RET
K1      EQU 13 ;KEYPAD 1
K2      EQU 14 ;       2
K3      EQU 5  ;       3
K4      EQU 20 ;       4
K0      EQU 15 ;       0
KEYS    DI
        PUSH AF
        PUSH HL
        PUSH DE
        PUSH BC
        PUSH IX
        LD HL,KFIN;RET ADDR ONTO STACK
        PUSH HL
        LD A,K1
        CALL &BB1E
        JP NZ,B1
        LD A,K2
        CALL &BB1E
        JP NZ,B2
        LD A,K3
        CALL &BB1E
        JP NZ,B3
        LD A,K4
        CALL &BB1E
        JP NZ,B4
        POP HL
        JR KCONT
KFIN    NOP
        NOP
        NOP
        LD A,K0
        CALL &BB1E
        JR Z,KFIN
        CALL WIPE

KCONT   POP IX
        POP BC
        POP DE
        POP HL
        POP AF
        EI
        RET
ISROFF  LD HL,TICK_BLOCK
        CALL &BCDD ;KL DEL FRAME FLY
        RET
ISRON   LD HL,TICK_BLOCK
        LD B,&81
        LD C,0
        LD DE,KEYS
        CALL &BCD7 ;KL NEW FRAME FLY
        RET
TICK_BLOCK DS 9
;ALTERNATE ISR ROUTINE
NOWAIT  DI
        PUSH AF
        PUSH HL
        PUSH DE
        PUSH BC
        PUSH IX
        LD HL,KEYFIN;RET ADDR ONTO STACK
        PUSH HL
        LD A,K1
        CALL &BB1E
        JP NZ,B1
        LD A,K2
        CALL &BB1E
        JP NZ,B2
        LD A,K3
        CALL &BB1E
        JP NZ,B3
        LD A,K4
        CALL &BB1E
        JP NZ,B4
        LD A,K0
        CALL &BB1E
        JP NZ,WIPE
        POP HL
KEYFIN  POP IX
        POP BC
        POP DE
        POP HL
        POP AF
        EI
        RET
        LIST
TFIN    EQU $
TSIZE   EQU TFIN-SCRMV
        END
```

Listing 2

the series should already have the code from &90C0 to &9135 in their computer, or tucked away on tape or disc. This was the intention, but a slight imperfection in the original code around &90ED has meant that two extra bytes have had to be squeezed into the program at this point, lengthening the routine and upsetting the values of the seven relative jumps which occur later.

In practical terms the original code saved portions of the screen quite happily until it enountered screen locations in a certain range, whereupon it refused to do the save. The routines used to test CALL &90C0 didn't use the critical screen locations and in consequence the bug didn't show up. The missing bytes are 20 05, a Jump Relative If Non-Zero instruction.

This month there are six entry points to the machine code. We have already met the first, CALL &9206,ST, which in conjunction with the menu designer creates the menu. Four separate calls invoke the menu of your choice. CALL &9175 pulls down menu block number 1, CALL &9185 pulls down block 2, CALL &9195 pulls down block 3 and CALL &919A pulls down block 4. Try CALL &9175 – menu 1 should come down. CALL &9185, Menu II, will now not work, since you can only have one menu on screen at any given time. Use CALL &91DB to wipe the menu from the screen. The original screen contents should be restored and if you type CALL &9185, menu II should drop down.

Once you have finished working with the Basic designer, it can be erased by command NEW. Your Basic programs can now use CALL &9185 (or any of menu calls) to pull down a menu and CALL &91BD to push it back up. Listing 4 shows a possible program segment which will handle a tranditional list of options menu. In the example of listing 4, option number one lists the program to the printer, and option seven simply pushes up the menu. Options 2-6 are not implemented.

May I interrupt?

Locomotive Basic runs amidst a constant flow of interruptions, most of which take place privately within the computer and are transparent to the user. If you've used the EVERY or AFTER commands you have already added your own Basic interrupt routines to those implemented by the ROM operating system and it's almost as simple to add machine code interrupt routines to the system. There is one important difference, if the routine fails to work first time and the result of that failure is a program crash, then the debugging procedure is horrendously complicated.

The main task of converting the menus to interrupt control falls to the Keys routine at &921F. It is this routine which scans the keyboard looking for the keypresses which signify "I want a menu now". The routine must deliver the correct menu, and also tidy up the screen afterwards.

The first thing you'll notice in Keys is that all the

registers are saved, an essential operation for an interrupt routine, and failure to do this will certainly lead to frequent and fatal program crashes. Next, four CALLs to &BB1E establish whether the function keys f1, f2, f3 and f4 have been pressed. If they haven't, an immediate exit from the interrupt routine is made via label KCONT, and the foreground program is allowed to continue. If one of the keys is found pressed, the relevant pull down menu routine is called, though you won't see any CALL code in the routine. In case this puzzles you, consider the test for key number 13, the f1 key. The code is:

```
LD HL,KFIN:KFIN is the address where the program flow must go to after
PUSH HL         :(and if) the jump to &9175 is made.
                :The PUSH puts the address on the stack.
LD A,13             :A call to &BB1E with the A register correctly loaded
CALL &BB1E          :tests the f1 key
JP NZ,&9175         :If f1 pressed, jump to the pull down menu1 routine;
                    :at the end of the pull down menu1 routine, the RET
                    :instruction will cause a return to label KFIN
```

If any pull down menu routine is called, then the program sits in the KFIN loop, waiting for the f0 key to be pressed, whereupon the menu will be removed with a CALL to &91DB.

The next step is to tell the computer that the Keys routine exists, and this is handled by a piece of code which asks the computer to add keys to the list of routines which are called regularly on interrupt. This is accomplished from Basic with a call to &9263 ISROM (Interrupt Service Routine ON). A call to ISROFF at &925C will remove Keys from the list, thus switching the pull down menus off. An alternate interrupt service routine is provided, which doesn't hold up the foreground program to any great extent. It's called NOWAIT and can be patched into the interrupt service routine, thus replacing the Keys routine, by the direct Basic command POKE &926B,&7A. Now if you press function key f1 menu one drops down, but the main program is not halted. f0 pushes up the menu as usual.

Active menus

In normal use the interrupt driven menu is probably best used for prompts, providing, for example, two Help menus if you're in Mode 1. Help menus are passive affairs, you look at them for information and that is all. Seasoned machine coders will have already worked out that it is possible to make the menus active rather than passive. To do this, the Keys routine, rather than the Nowait one is used, and a JUMP instruction is inserted at &9247, the address of label KFIN, replacing the three no-operation instructions which are there.

After a function key press has been detected and a menu displayed, the program flow goes to KFIN and then makes the jump to a new piece of code (which must of course be written). This code should scan the keyboard looking for a user's response to whatever instruction or options were contained in the pull down menu and take appropriate action if certain keys were pressed. This will all happen with the foreground program suspended. All the extra code is technically a gigantic interrupt service routine.

If it becomes too lengthy the computer may begin to wonder if its every going to be allowed to service other interrupts or get on with the main program. However this is something of a diversion. The pull down menu system doesn't have to run under interrupt, and in Listing 4 where the menu is simply called by a line of Basic, the menu is nevertheless fully active. It offers options to which a keypress response is expected. How you use the pull down menus in your programs, is, as ever, entirely up to you.

ACU

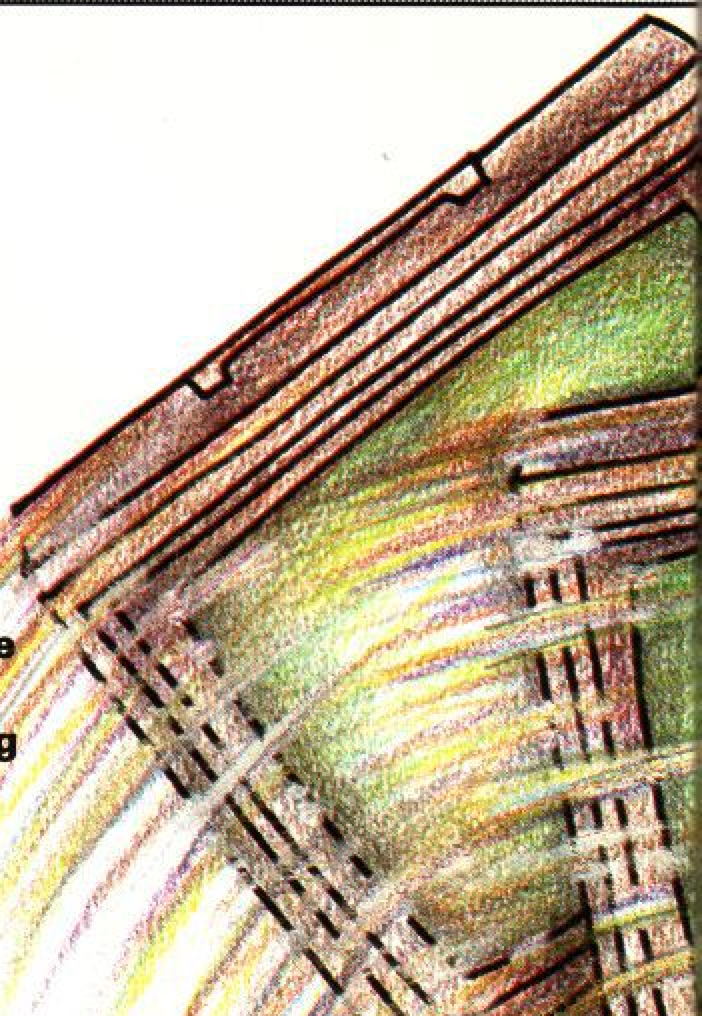
```
100 MEMORY &6CFF
110 RESTORE 150
120 FOR a=&90C0 TO &92B5
130 READ A$:POKE A,VAL("&"+A$):NEXT
140 SAVE "M20.BIN",B,&90C0,&1F6:STOP
150 DATA DD,4E,0A,06,0C,21,94,78,DD,7E,0
    0,77,DD,23,23,10,F7,CD,11,BC,47,3A,94
160 DATA 78,6F,3A,95,78,67,E5,DD,E1,3A,9C
170 DATA 78,5F,3A,9D,78,57,3A,9B,78,92,D
    8,20,05
180 DATA 3A,9A,78,93,D8,3A,98,78,6F,3A,9
    9,78,67,E5,C5,D5,CD,1D,BC,D1,C1,CB,41
190 DATA 28,06,DD,7E,00,77,18,04,7E,DD,7
    7,00,DD,23,E1,2B,3A,97,78,BC,20,E0,3A
200 DATA 96,78,BD,20,DA,78,13,FE,00,28,C
    0,13,13,13,FE,01,28,B9,13,13,13,13,18
210 DATA B3,00,00,A0,78,80,00,C7,00,9F,0
    0,00,00,E0,83,80,00,C7,00,3F,01,A0,00
220 DATA 40,7E,80,00,C7,00,DF,01,40,01,8
    0,89,80,00,C7,00,7F,02,E0,01,A0,78,80
230 DATA 00,C7,00,9F,00,00,00,E0,83,80,0
    0,C7,00,3F,01,A0,00,00,00,CD,11,BC,3D
240 DATA 28,05,21,37,91,18,1D,21,5F,91,1
    8,18,CD,11,BC,3D,28,05,21,41,91,18,0D
250 DATA 21,69,91,18,08,21,4B,91,18,03,2
    1,55,91,11,94,78,ED,4B,73,91,AF,B0,B1
260 DATA C0,22,73,91,D5,DD,E1,01,0A,00,E
    D,B0,CD,11,BC,47,DD,6E,00,DD,66,01,E5
270 DATA 21,00,6D,DD,75,00,DD,74,01,0E,0
    0,CD,D5,90,E1,7D,32,94,78,7C,32,95,78
280 DATA 0E,01,CD,D5,90,C9,11,94,78,D5,D
    D,E1,2A,73,91,AF,B5,B4,C8,01,0A,00,ED
290 DATA B0,CD,11,BC,47,21,00,6D,DD,75,0
    0,DD,74,01,0E,01,CD,D5,90,21,00,00,22
300 DATA 73,91,C9,EB,11,94,78,01,0A,00,E
    D,B0,CD,11,BC,47,0E,00,CD,D5,90,C9,F3
310 DATA F5,E5,D5,C5,DD,E5,21,47,92,E5,3
    E,0D,CD,1E,BB,C2,75,91,3E,0E,CD,1E,BB
320 DATA C2,85,91,3E,05,CD,1E,BB,C2,95,9
    1,3E,14,CD,1E,BB,C2,9A,91,E1,18,0D,00
330 DATA 00,00,3E,0F,CD,1E,BB,28,F6,CD,D
    B,91,DD,E1,C1,D1,E1,F1,FB,C9,21,71,92
340 DATA CD,DD,BC,C9,21,71,92,06,81,0E,0
    0,11,19,92,CD,D7,BC,C9,00,00,00,00,00
350 DATA 00,00,00,00,F3,F5,E5,D5,C5,DD,E
    5,21,AE,92,E5,3E,0D,CD,1E,BB,C2,75,91
360 DATA 3E,0E,CD,1E,BB,C2,85,91,3E,05,C
    D,1E,BB,C2,95,91,3E,14,CD,1E,BB,C2,9A
370 DATA 91,3E,0F,CD,1E,BB,C2,DB,91,E1,D
    D,E1,C1,D1,E1,F1,FB,C9
```

Listing 3

```
50 REM KEYPRESS "1" PULLS DOWN PDM 1
100 A$=INKEY$:IF A$ <> "1" THEN GOTO 100
110 CALL &9175:REM PULL MENU DOWN
120 A$=INKEY$:IF A$="" THEN GOTO 120
130 A=INSTR("1234567",A$)
135 REM 6 OPTIONS WITHIN THE MENU
140 ON A GOTO 1000,2000,3000,4000,5000,6
    000,7000
1000 CALL &91DB:LIST #8:STOP
6950 REM OPTION 7 CANCELS THE MENU
7000 CALL &91DB:REM PUSH MENU UP
```

Listing 4

6-8-4-5 Who do we appreciate?



Graphics handling on the CPC machines is impressive as it stands, but with a little inside information you can get the display exactly as you want it. Chris Laing spills the beans

The screen display modes and format are determined by a combination of the firmware, the infamous ULA and the 6845 cathode ray tube controller.

It is possible to generate differing displays by altering the standard configuration using either the 6845 or the ULA. Unfortunately as soon as you start to wander away from the standard formats the firmware becomes practically useless when addressing the screen. In fact it can be positively annoying because there is no way of letting the screen know that you are going to try something slightly different for a change, so it assumes that everything is tickety-boo, just as it was before.

Unsuspecting Arnold

The moral of this is that the techniques discussed here are not for the faint hearted, because once you start playing around with the screen you're on your own, even Soft 158, cannot cope with the things we are about to do to your unsuspecting Arnold.

Having finished the public health warning, it has to be said that there are great rewards in terms of screen access time that can be gained from this approach.

There are 16 registers in the 6845 controller that are used to configure its operation, and they are detailed in Table 1. Although there is provision for a 6845 controlled cursor, this is not implemented in the Amstrad's hardware and so is of little use to the programmer.

To access the internal registers the number of the required register must be output to location &BC00 and the data to be sent to the register is output at location &BD00. As an example, suppose that we wish to set the value of R13 to 5. The following program sequence would then be required.

```
;
LD BC,&BC0D     ; set the register number
                        first
OUT (C),C
LD BC,&BD05     ; followed by the value
OUT (C),C
;
```

Note the technique of setting the value required into the C register. This is possible because only the high byte is significant in the I/O address for this chip.

The first two registers that we shall examine determine the positioning of the display on the screen. The horizontal sync position register (R2) allows the display to be moved left or right. Increasing it moves the screen to the left, and decreasing it moves the screen to the right. Similarly, the vertical sync position register (R7) allows the display to be moved up or down. Increasing it moves the screen up and decreasing it moves the screen down.

Several effects can be created by altering the values of these.

Listing 1 is a program that bounces the display around the screen. This feature is sometimes used while a picture is being drawn on the screen and stopped when the drawing is complete, giving the impression of a lot of activity whilst the picture is being composed. By varying the values in the data table, different effects can be created for example if the horizontal position is maintained constant, the screen can be made to shudder.

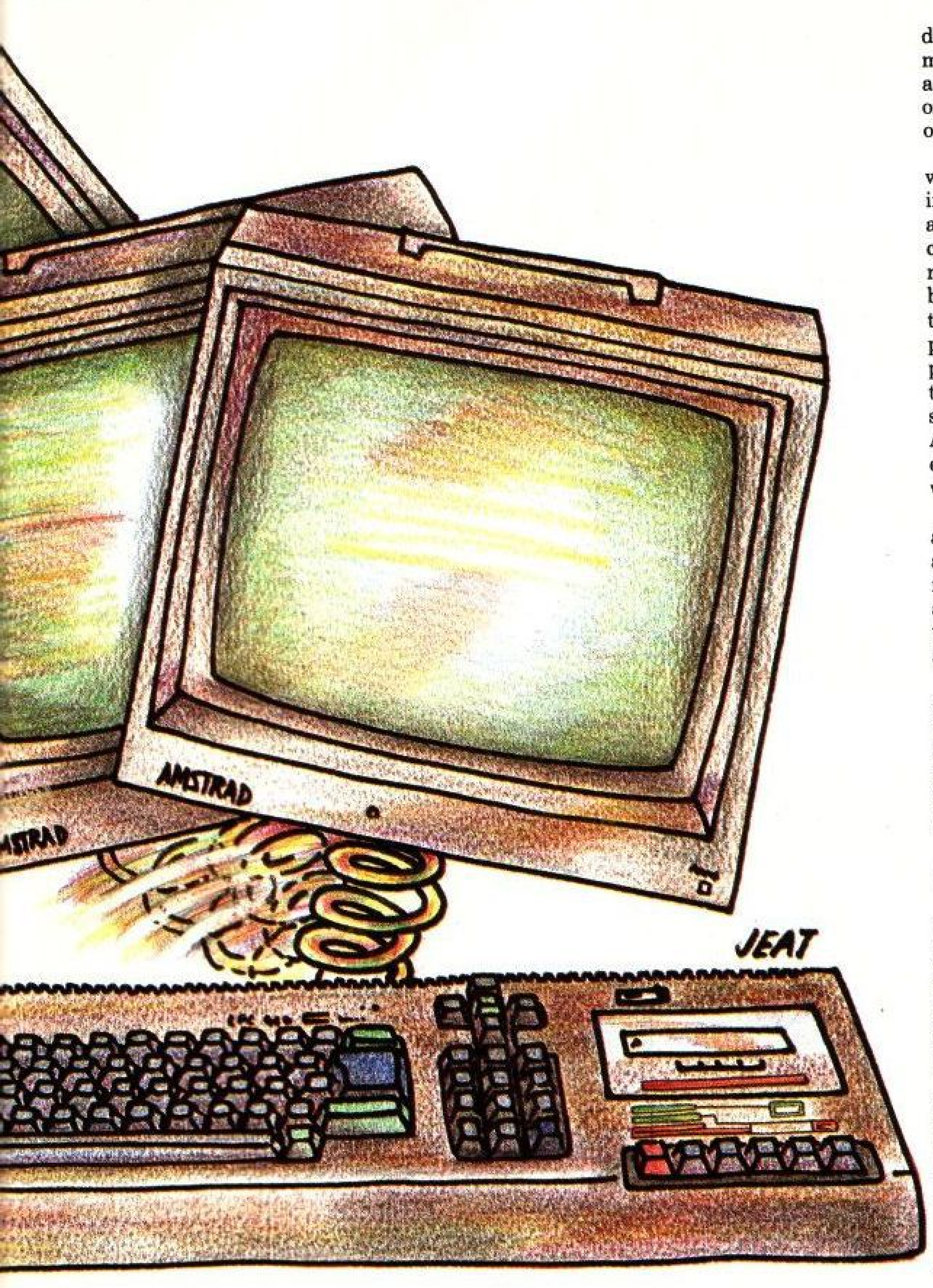
This is often used in conjunction with an explosion. It is worth mentioning that altering only these registers does not have an effect on the firmware which can therefore still be used for writing to the screen.

Before we move on to examining how we can really change the screen display format, let's consider how the screen memory addressing works. Each character cell is made up from an eight by eight matrix, and although the width of each character varies according to the mode, the height is always the same. Each of the rows that make up the character is termed a raster, so there are normally eight rasters for each character, numbered 0-7 (see Figure 1).

```
. . . O O . . .   – Raster 0
. . O O O O . .   – Raster 1
. O O . . O O .   – Raster 2
. O O . . O O .   – Raster 3
. O O O O O O .   – Raster 4
. O O . . O O .   – Raster 5
. O O . . O O .   – Raster 6
. . . . . . . .   – Raster 7
```

Figure 1

16k of RAM is allocated for the screen



memory, which is divided into eight 2k blocks. These each contain the information for one raster for the entire screen, so block zero contains the information for the top pixel row in all characters and block seven contains the information for the bottom pixel row in all characters.

When the information is displayed it is read out of a raster block in consecutive bytes up to the end of one line; the next byte then wraps round to the start of the next line. If the end of a 2k block is reached before the bottom of the screen it wraps round back to the beginning of the block. The important feature is that the memory map is independent of the number of characters displayed on a line.

This is where things can really start to be fun. Having discovered that we are not restricted to the standard number of characters per line, let's see how we set about changing it. The registers concerned with the horizontal parameters are the horizontal total register (R0) and the horizontal displayed register (R1).

R0 is concerned with timing considerations to ensure that the start of one line is displayed correctly in relation to the end of the previous one, and should not normally be altered (although it can produce some interesting effects). R1 is the register that actually determines how many characters are displayed across the screen. The value it contains corresponds to the number of characters in mode one. This is doubled to obtain the number displayed in mode two, and halved for mode zero. Care should be taken to use an even number if working in mode zero, or half characters will appear at the end of lines.

"Why?", you may well ask, "would I want to change the number of characters in a line?" There are several possible answers to this question. If the number of characters per line is reduced, some memory is freed at the end of each 2k block of the screen RAM. Note, however, that this memory is not contiguous. A particular application such as word processing, may require more characters to be displayed on a line than the standard 80 that are available in mode 2. A game that involves a lot of animation is easier to write if the action is contained within a smaller playing area.

The final reason for altering the screen area is perhaps the most important, and again we resort to the screen memory map for its explanation. When directly addressing the screen, the calculation of the memory address is non-trivial, as anyone who's tried it will confirm.

Basically, moving horizontally from one pixel to another is simply a matter of incrementing the address by one, two or four depending on the screen mode, and moving vertically within a character cell requires the addition of 2k to move into the next raster block.

Calculating the changes

The difficulty arises when moving between character blocks vertically. The offset required for this transition is dependent upon the number of characters displayed in a line because of the wrap-round feature described earlier. The default value for this is 80 to move from one raster row to the corresponding raster row in the character cell below it (there are 80 characters by default in mode 2). The hex value for this offset is &50.

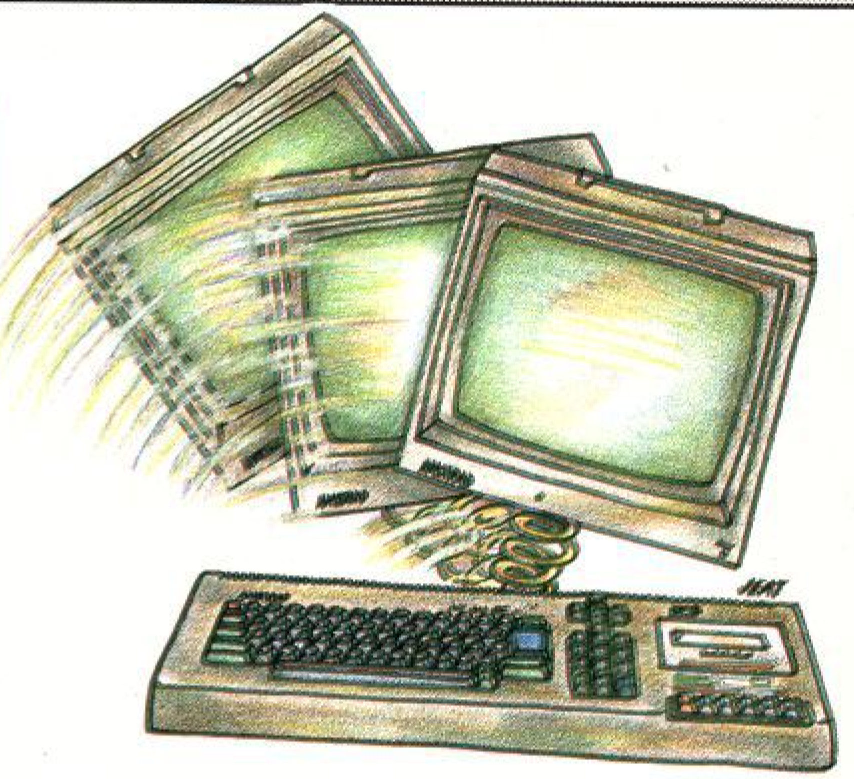
To calculate the offset for a line 10 characters below the current one therefore requires multiplying &50 by 10. Although this is not beyond the realms of human comprehension, it would be much nicer to be multiplying by &40 when working in machine code, as all self-respecting games programmers do. This is comparable to multiplying by either 10 or 13 in decimal – even I can manage to stick a zero on the end of a number.

The saving is only a couple of bytes of code for one operation, but when you're constantly accessing the screen the difference really becomes noticeable – ever tried playing Starion?

OK, so we've decided that we'd rather be multiplying by &40, but what does this mean? Well &40 is 64 in the real world and this is the number of characters that we want to display in

```
Listing 1.
;
; This program bounces the display around
; the screen.  A data table contains.
; a series of values for the Horizontal
; and Vertical sync positions with a null
; signifying the end of the table.
;
; The speed of the 'bouncing' is
  determined by the value of the counter
; variable.
;
          ORG     &4000
;
waitfly   EQU     &BD19     ; MC_WAIT_FLYBACK
counter   EQU     &4000     ; delay counter
;
          LD      BC, &BC00
restore   LD      HL, DATA   ; point to the data table
;
readin    LD      D, (HL)    ; read horizontal sync data
          INC     HL
          LD      A, D       ; test for end of data
          OR      A
          JR      Z, restore ; if so go back to start
;
          LD      E, (HL)    ; read the vertical sync
          INC     HL
;
          CALL      waitfly  ; synchronise with
;                              frame flyback
;
          LD      C, 2
          OUT     (C), C ; set horizontal sync
          INC     B      ; go to the data port
          OUT     (C), D
          DEC     B      ; back to address port
;
          LD      C, 7
          OUT     (C), C ; set the vertical sync
          INC     B
          OUT     (C), E
          DEC     B
;
          CALL    delay  ; wait a while
          JR      readin ; and go round again
;
delay     LD      DE, counter
;
dloop     LD      A, D  ; end of delay?
          OR      E
          RET     Z     ; yes, then stop
          PUSH    HL    ; else waste some time
          POP     HL
          DEC     DE
          JR      dloop ; until its done
;
DATA      DEFB    47,31,48,32,47,31,46,
                  30,47,29,48,28,47,29,46,30
          DEFB    45,29,44,28,45,29,46,30,45,
                  31,44,32,45,31,46,30
          DEFB    0,0
;
```

Listing 1



Register function		Default value
R0	Horizontal Total	63
R1	Horizontal Displayed	40
R2	Horizontal Sync Position	46
R3	Hsync, Vsync Pulse Widths	&8E
R4	Vertical Total	38
R5	Vertical Total Adjust	0
R6	Vertical Displayed	25
R7	Vertical Sync Position	30
R8	Interlace and Skew	0
R9	Maximum Raster Address	7
R10	Cursor Start Raster	—
R11	Cursor End Raster	—
R12	Start Address (High)	—
R13	Start Address (Low)	—
R14	Cursor Address (High)	—
R15	Cursor Address (Low)	—

Table 1: The 6845 integal registers

mode 2, which is twice the value that should be programmed into R1. With a dextrous piece of mental arithmetic we deduce that we need to set R1 to 32. Now having reset the number of characters displayed on the line it has become shorter, and so to restore a sense of symmetry the display can be centred by altering R2 to 42.

A similar piece of jiggery-pokery can be performed on the number of rows displayed, although in this case it is relevant only for reduced playing area and to release some memory. The registers concerned are vertical total (R4), vertical total adjust (R5), and vertical displayed (R6). R4 and R5 are again used for timing and R6 is the one that actually determines how high the screen is. The value it contains corresponds directly to the number of character rows on the screen. Here again the display can be centred by altering the value in R7.

There is a second way that the vertical display can be altered. If you recall each character cell is made up of eight rows with the rows corresponding to rasters and the information for the rasters is stored in a 2k block. The number of rasters displayed on each line is controlled by the maximum raster address register (R9). The default value is seven, hence the eight rows (0-7). This value can be varied; setting it to four will cause only the top half of each line to be displayed, whereas setting it to 16 will cause each line to be displayed twice.

A bonus of using this method to reduce the display is that for each raster removed, 2k of memory is liberated for program use. There is, however, a drawback to this approach in that it affects the overall timing of a frame, and so when R9 is adjusted, R4 and R5 must be reprogrammed accordingly. As ever, there is a magic formula which determines what these should be:

$$\mathbf{R4 = INT(312/(R9+1))}$$

$$\mathbf{R5 = 312-(R9+1)*R4}$$

These are simply calculated once the number of rasters required has been decided. Note that if the number of rasters is increased, then multiple images of the same line are created.

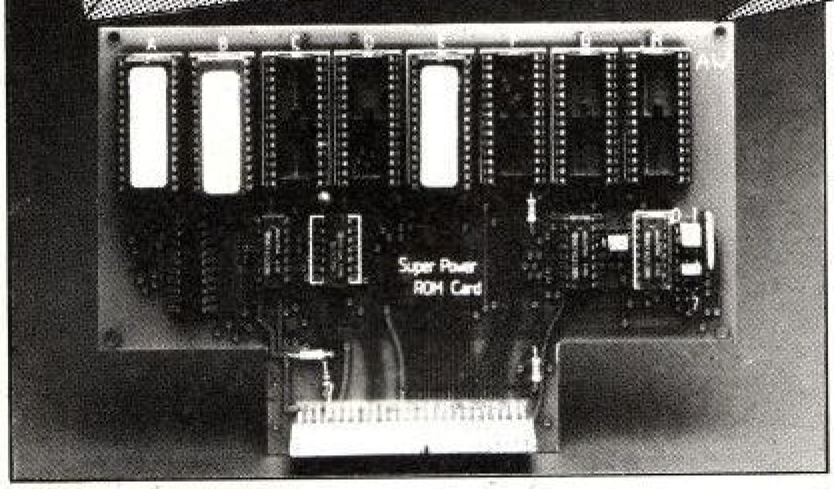
The start address registers (R12 and R13) can be used to scroll the screen either vertically or horizontally. Vertical scrolling is achieved by altering the value of the lower 12 bits by the length of a line in bytes. The line length is twice the value stored in R1. Altering the lower 12 bits by anything other than a line length will cause horizontal scrolling.

A combination of horizontal and vertical scrolling can be achieved by changing the offset by a value greater than a line length. Bits four and five of R12 are used to set the screen base to be either &0000, &4000, &8000 or &C000. Register R3 is used to set the pulse widths given out by the 6845 at the end of every line and the end of every frame. These are used by the internal hardware and should not be altered from their default values.

The final register (R8) is used to determine the type of scan that the monitor uses. The Amstrad monitors all use a non-interlace type and so this need not normally be set. As a final effect, however, try setting this register value to 1 – you are advised to hold onto your lunch!

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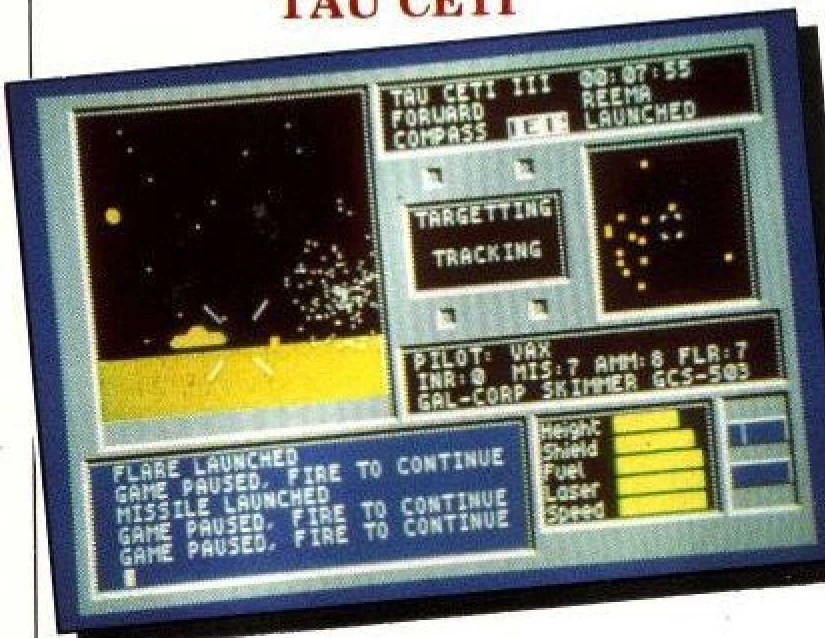
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SOFTWARE REVIEWS

GAME OF THE MONTH

TAU CETI



A program from CRL, that is best classed as "only pick me up if you have a whole weekend spare". As Elite, it is a genuine epic, no way are you going to blast your way through this in an evening.

It looks fairly innocuous in its little black box, all snuggled up with its instruction leaflet. But what a surprise you get when you load it (and it will load, no fancy funny loaders, and fully 664/6128 compatible). You have a bit of a graphic adventure, screens of the interior of your hangars, a bit of a text down the bottom, re-definable keys, a veritable arsenal that makes a Tornado jet look tame and a little story to set the scene.

As someone once said, "I'm gonna tell you a story". In 2050, it says here, four close stars were colonised, including (where have you seen this name before) Tau Ceti. Fifty cities were started up on the third planet and then a plague hit, followed by a meteor, followed by a robot take-over bid. Everybody got the message and legged it at warp factor 9 to laze in the sun on the beaches of Santraginus V, and get over it all with the aid of a few Pan-galactic Gargle Blasters.

One hundred years later . . . Some mug (you) decides to have a crack at re-colonising the planet, despite it having been taken over by robots who think they can do better without humans.

Gal-Corp. central (the same people who have written "No user serviceable parts – refer to qualified personel" on your airlock) have issued a few guidelines to you on how to use the jump pads, how to use an airlock, to look out for killer fleas and a stern warning not to blast up too many non-offensive buildings as they do really want to colonise the place when you've finished with it.

The rest of the leaflet has some piccys of what the graphics are supposed to look like for the buildings. Places that can restore and repair are shown but not all the buildings are listed, neither are the fleas (sand hoppers, they call them), mines or robot crawlers. You just have to find out from experience. Good job you can save the game isn't it?

Once you have rejigged the controls to work with a joystick you tell it to launch, and have a nose around at the outside world. Mostly tall buildings, with the odd dome and an occasional thingy shooting at you, a bit like London really.

The outside world is displayed in an area about one quarter the size of the screen in the top left corner. The way that the airlock door smoothly slides up and down in this area is beautiful to watch. There is a real-time clock in the top right corner, and outside a sun is shining. It don't shine for long though, the day is only one hour long and you'll soon use that up in this game. As you get closer to sunset, the surroundings become more and more heavily shadowed, until they are only visible because of the chunks they take out of the horizon. This change is really gradual, not something that happens in a flash.

The whole 3Dness of the view is very well done. Shadows form on the right sides of the buildings, and as you fly round them while looking out of the side viewport the shadow shrinks and grows. Things get bigger and smaller as dictated by perspective and explosions seem less severe when you are a long way off.

To brighten the night up a little – so you can see who's shooting at you clearly – you can drop a flare. You only get eight of these and they don't last long, so you can use an infra-red night sight. This has a very persistent and blurred image as per your real night sight, everything leaves a bit of a trail.

Your lasers leap about a bit but the missiles (all eight of them) are great, they lock on to the target with no messing about and multiple launches are allowed. It gets fairly sneaky as both you and the enemy have missiles and anti-missile missiles. A double shot nearly always gets 'em though.

There is a comprehensive map of the jump pad network, allowing you to zoom in or out, scroll sideways, and to ask for information on any city on it. The info tells you how big the city is, what its defences are, and what jump pad links it has.

By now you will have cottoned on that this is a complex game. To help out with the complexities, there is a save game feature (tape or disc) and a notepad built in to the game for your notes. Very thoughtful of them is that.

The eventual aim of the game is to mix 'n' match the pieces of reactor cooling rods that you find in sub-stations (a puzzle in itself) so that you can do for the main reactor and shut down all the robots without Gal-Corp. having to wipe everything off the planet. Mind you, after I've finished blasting around out there it might have been a little tidier.

This game beats ordinary shoot-em-ups into a cocked hat. I can thoroughly recommend it to anyone fancying a bit of a challenge without having to learn about the life and times of J.R.R. Tolkein (which, as we all know, is hobbit forming). When you're finished with the tape Ed . . .

AUTHOR CRL
PRICE £9·95

GRAPHICS	19	FIRST IMPRESSION	16
SOUND	13	LASTING IMPRESSION	19
POLISH	19	VALUE	19

COMMENT A planet-born Elite
All scores out of 20

SKYFOX

This is a cockpit view shoot-em-up, featuring ground and air attacks which have very little to do with a flight simulator. The attacks are mostly directed at you and your base, and are spread over a huge map which has no rivers and some magical mountains that are always just on the horizon.

The first thing that struck me about the game was the time it took to load up, absolutely ages. Make cup of tea, read "The Hobbit", eat a four course meal and have your appendix out and it might just have finished loading.

At first I thought that this time dilation factor might just be my familiarity with disc drives, but a skim through the instructions (spoken in both Amstrad and Spectrum) revealed that you might have to flip the tape over during the game. It's a biggie!

While the loading was getting on with it, I tried to skim through the instructions for playing the thing. Although they are not that long, skimming through them is not easy. unless that is, you are one of those people who has the ability to read and digest Amstrad firmware manuals overnight. Putting it bluntly, this is one complicated game.

To illustrate how complicated it is, there are no less than 10 training levels – blasting tanks only, planes only, alternate waves, both together, mini-invasion, full-blooded invasion and then the heavy stuff with different opening moves; like in the better games of chess which I can't play very well either.

Right, helmet on, joystick ready, clear away remnants of four course meal and put jar containing appendix on top of the computer for a mascot. First select the easy level, pinpoint a hot-spot on the map, and launch at it. The auto pilot in this game can do quite a bit you know, and you can guide it by pointing at the map while in flight.

Now the tragic bit, the view out of your cockpit moves a chunk at a time. No flicker, but the view changes as infrequently and drastically as my tax code. I think this is because they are switching between two screens and altering the one you are not looking at.

The cockpit contains all the sort of information you would expect to find in an inter-galactic anti-tank/plane colony protection vessel. The number of missiles left, your current position and where the enemy are are all on display somewhere. A crib sheet supplied with the game helps you find the right dial if you get lost.

The tanks and planes look pretty much like moderately chunky tanks and planes, all done in what looks like mode 1, or at least with only three colours in it. Small mistook here, the distructions say that the shield power remaining is in red. Either I am red/blue colourblind or it's in blue. The sound effects are pretty much what you have come to expect by now, and you only notice them when some anti-noise pollution lobbyist in the family comes along and turns them off.

The gunsights are non-existent, and you just have to follow the shots to their vanishing point and put your target somewhere on that line. The radar scope does give a choice of top and side views with a range readout though, which almost makes up for the lack of decent sights.

The controls seem to be a bit sluggish and not very well de-bounced. This may just be an illusion caused by the slow screen update, but you frequently end up turning a missile off again just after arming it.

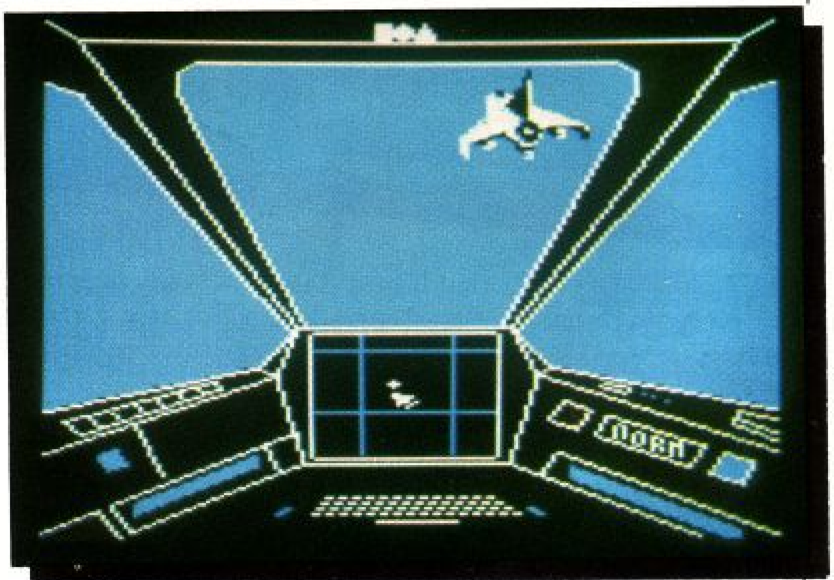
Only the one bug in the game spotted so far; you can blast down all the planes in a training level and sometimes the game won't end or give you any more planes to shoot at. No other bugs yet, but that might have something with me not lasting very well on the higher levels.

The best way of dealing with the tanks was to fly at them at high speed with the aid of the afterburners. ("Look at that go, Mummy Bird". "You'd shift that fast if your tail was on fire son".) When they start to look like tanks, you cut the engines completely and hover. The tanks are then at just the right distance for you to blow them to the scrapyard but for you to still be safely out of range. Buzzing them just wastes your ammo.

Planes are much harder and need much chasing about before you can blow them out of the sky. People shouting at you: "It won't go any faster if you bend the joystick", don't help much either.

The higher levels of play definitely require a bit of strategy to complement the joystick wiggling. If only the screen update had been smoother and you could really control the guided missiles, this would have been a super game.





AUTHOR ARIOLA SOFT
PRICE £8.95
GRAPHICS 16
SOUND 17
POLISH 17
FIRST IMPRESSION 16
LASTING IMPRESSION 18
VALUE 17
COMMENT A Chart No. 1

THREE WEEKS IN PARADISE

This is the latest in the long and successful Wally series of games from Mikro-Gen. Three Weeks in Paradise continues where Everyones a Wally left off. Wally and the gang had to complete several tasks around town before going on a well earned holiday. However Wally's idea of a holiday is to get lost on the high seas in a pedal boat with Wilma, his wife and Herbert, his son. They end up marooned on a desert island. Wilma and Herbert wander off, only to be captured by the local natives, the Can Nibbles. Wally has to rescue them.

You take the part of Wally, resplendent in yellow loincloth and complete with knotted hanky on head. In the jungle around you there are bats flying about. Like most other moving obstacles they are easy to avoid but drain your energy on contact.

The screen is divided into two parts, the play taking place in the top of the screen, with the bottom quarter telling you how many lives you have left, and showing you which objects you are carrying. As you haven't any pockets in your loincloth you can only carry two objects. In the bottom right of the screen are two skeletons, one for Herbert and one for Wilma, they show what your family will look like if you don't look sharp.

At the bottom of the screen is an outline of an object that will become more clear as you complete the adventure. There is no energy meter but you have a limited amount of resistance to creatures such as the bats, wandering natives, fish, and sea-horses before you lose a life.

The Mikro-Gen graphics are as cartoon-like as ever with a black outline around them so they stand out from the background. What is new is that Wally walks behind some things, grass, signposts, chests, pillars and in front of others. Another difference is that you can pick up objects and put them down anywhere you like. You can Use objects, rubbing two sticks together to make a fire.

Wandering around the jungle you encounter Herbert in a huge cooking pot, guarded by two lions. A plaintive "DAD!" scrolls across the bottom of the screen. Clues and comments often scroll across the bottom two lines, depending on which location you are in, Such as "Finders Keepers", "Help! its me, Wilma!!" from Wally's wife who is being hung from a tree by her heels and guarded by a native, or just "Ribbit!!" from the giant frog sitting outside a hut.

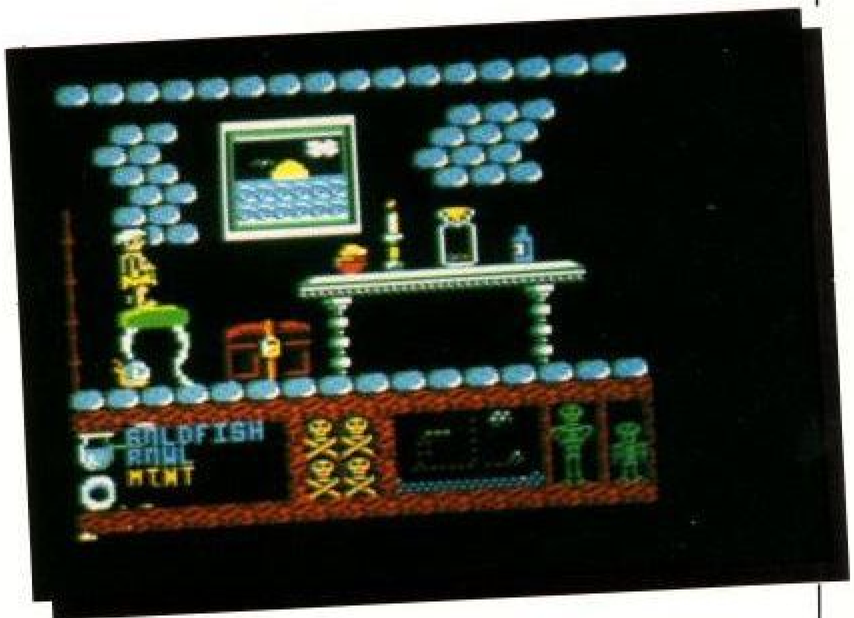
It's not all jungle screens, there is an underwater scene where Wally does the doggy paddle down to Davy Jones' locker, a temple, an abandoned trading post which is now the home of a lion and other signs of the previous inhabitants that have been eaten by the Can Nibbles.

The objects and their uses are usually straightforward; needing flip-flops before you can walk across the sand, but what to do with the bowl of stuffing or the goldfish? And what use is a blunt axe? The scrolling messages will provide slight clues, but a warped sense of humour is a greater help.

In the jungle paths are conveniently signposted and you can go through the screen to a parallel pathway. Some locations are reached by odder means; try jumping into the seaside painting to get to the beach.

Mikro-Gen claims that the puzzles are a little easier than Everyones a Wally, but much harder than Dummy Run. Don't feel that you need to have played the other Wally games to enjoy Three Weeks. The variety of the locations and puzzles and the quality of the graphics make this a worthy buy. I particularly liked the way the giant frog's chest expanded when he croaked. Those of you who map games will be glad to know that it even connects up sensibly.



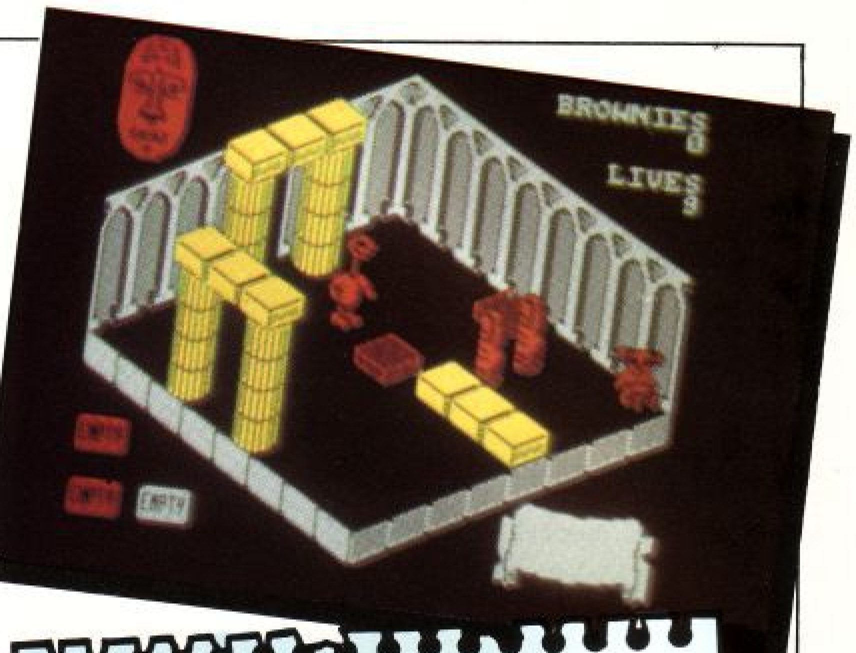


AUTHOR MIKRO-GEN
PRICE £9·95

GRAPHICS	18	FIRST IMPRESSION	16
SOUND	17	LASTING IMPRESSION	18
POLISH	18	VALUE	17

COMMENT Wally at his best

SWEEVOS WORLD



AUTHOR Gargoyle Games
PRICE £7·95
GRAPHICS 18
SOUND 1
POLISH 17
FIRST IMPRESSION 14
LASTING IMPRESSION 18
VALUE 18
COMMENT An improvement on the 'ultimate' style

It must be pretty fair to say that the two games that have made best use of the Amstrad machines up to now have been Knightlore and Alien 8 from Ultimate (and perhaps even Nightshade, their most recent release).

However, when they brought out the second of these two a lot of people moaned that the game format was too similar to the first. This is of course absolute rubbish. Once you're on to a winning idea why not make the most of it?

It was inevitable therefore that in the fullness of time the same type of game would appear from other software houses (in the same way that Manic Miner and Jet Set Willy spawned a whole new game type in days gone by). Unfortunately, successors to an original theme seem almost invariably to be quite inferior to the original but this definitely is not the case with Sweevos World from Gargoyle (the people who already have their own original game format used in Dun Darach and Marsport).

Once again, the basis of the game is a large map of rooms each one being depicted in reasonably convincing 3D view. Sweevos World has taken the idea a little further by spicing up the original monochrome idea so that each room is shown in four colours (three really because black is always used for the background). The speed of operation has also been noticeably improved upon. There is no longer a feeling that you're walking through a time warped world of limbo when you enter a room in which there happens to be a lot going on.

Things missing from this one that the Ultimate games did have are the ability to shuffle the scenery about and the ability to jump. This is never actually needed in the game but there are some puzzles that initially look impossible without the possibility of jumping.

The most important thing that seems to be missing however is any form of sound. The loader plays a very catchy little ditty but as soon as the game is entered a wall of silence falls. Not even so much as the pitter patter of footsteps is to be heard – a bit of a pity but it's probably better to have the prettier graphics and enhanced speed.

The actual aim in the game is to clear the map of various mutant creatures by dropping objects on them. There are tins to be picked up which can usually be used to aid in reaching a level that might otherwise be too high. These are used in conjunction with the lifts that are dotted about all over the place. Quite often two adjacent lifts will be found so that by switching from one to the other and dropping tins on the alternative lift it is then possible to rise to an otherwise unobtainable level.

It isn't easy to generalise about the nature of the problems that you are faced with though. Each object to be picked up or nasty to be avoided has its own foibles and pitfalls. This is where the game really scores against the opposition. In other games there was a standard technique for getting over walls (drop an object, jump on to it then pick it up again as you jump off it over the wall). The same just isn't true in Sweevos World. Each time you find something to pick up you'll have to put on your thinking cap to work out how it's to be done.

The world is on a number of levels and at various points there are "launching pads" that will bounce you up to the next level. There are also holes dotted about that can be dropped through to go down a level. (Be careful, there is one hole that allows you to drop out of the game.) Some of the objects to be picked up can only be got by dropping down to them from a room above so it's an absolute necessity that you should make a map unless you happen to be particularly good at memorising geography.

There is a pleasant level of humour in the game as well. For instance, you have to pick up BOOs and then go up behind a duck-like creature and make use of it, in other words you have to say BOO to a goose!. Another nice feature of the game is that an object dropped through a hole will still be there when you drop after it so that an otherwise deadly obstacle below a hole can be covered. There are various types of scenery to be found in the rooms – the best are the 1 TON weights that are held up by a semi-transparent beam.

Once the beam is touched the weight comes crashing down barring your pathway or worse still, flattening you. Re-entering a room will put them all back up a height though. There are also fingers which rise up out of the floor. It's usually just a matter of waiting for them to go down and learning how long any particular one takes before it re-appears again. There is also a body of gnome-like men that come up through the floor, but they never go back down again so you have to make a mad dash across them before they rise.

Various types of static object are also to be found. Bumping into them produces the message "Ouch!" and the smiling face that shows your status stops smiling. A few more touches and you can say your prayers. The more mobile types (the fingers and gnomes) are deadly at the first touch. Around the game area you may also find characters sitting looking like Cornish Pixies. These are Brownies and "Brownie Points" are to be gained by picking them up. Like so many of this type of game it is only possible to carry three objects at once. The system most games use for allowing you to pick them up and drop them is on a first in first out basis – not in Sweevos World though.

A highlighted block circulates around the three positions and the next time the fire button is pressed to pick up an object it is put into the current position or is dropped if an object already occupies the space. This is really annoying when you only have a split second to pick up an object and end up dropping something else instead, but I suppose it all helps to add to the difficulty of the game which for my money is one of the most entertaining that has appeared for the machine. It can be played with either keyboard or joystick and will work on all models of machine.

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SIR FRED

This Mikro-Gen release was not written by the team responsible for the Wally series but by the programmers who wrote Roland on the Ropes for Amsoft. The result is a graphical adventure which is very different from the Wally series with the accent more on action than on brainpower.

Your quest as Sir Fred is to rescue the King's daughter from the wicked Sir Hugh D'unnyt, not an easy task. Each time you play the game the princess is put in one of seven locations. The starting positions of the objects changes from game to game so you must modify your actions as you find the objects.

A sword is essential to get past some of the guards. The bow and arrow is useful for dispatching some of the serfs, and you can choose from three angles of flight. The arrows are needed to flick some switches which you can't reach so don't waste them.

Sir Fred is a proper little action man, he runs, jumps, swings on ropes, swims through piranha-infested waters, indulges in sword fights and throws stones. He can carry up to four objects, some can be used only once, such as the food for energy, some can be used only a number of times such as the bow and arrows, and some can be used all the time, such as the sword.

You must be careful when picking up an object to move your selection pointer to an empty "pocket" or the object you pick up will destroy any you are carrying, something I found a little hard to cope with at first, trying to get some stones while being nibbled by a piranha, but it is easy enough to move the pointer before you enter a new location.

The emphasis is very much on action – running, jumping and swinging on ropes to get yourself catapulted over walls. The ropes are very difficult to master until you realise that Sir Fred must just flick himself to the outside of the rope on the upswing to get a little more height each swing, something that could be better explained in the insert.

Sir Fred has some degree of intelligence when you are controlling him. When you get to the top of a rope and press the down key he will turn and climb backwards a little way down the rope before you can continue. He will also conveniently climb out of the water when he gets to the edge.

You feel as if you are in control of a little person as he digs his heels in and skids as you try to stop him running. Sometimes the control is not as precise as you would want. If Sir Fred accelerates by you holding down a direction key too long, he can be slow to turn round, dug in heels and all, which can mean you can be catapulting him into danger.

The keys are definable, and apart from the direction keys you have one to select an object and one to use it. The graphics are fairly simple, with the only multicoloured things being the objects and characters. Nice touches are Sir Fred's eyes that blink. In the dark rooms a torch is essential, this casts a small pool of light around Sir Fred and leaves the rest of the room in darkness.

The objects you find are fairly straightforward to use and are only necessary to allow you to get to other parts of the game, rather than be used to solve a puzzle. Throw the meat in the river to distract the pirahna, tempt the drunken boatman with the bottle of beer to get across the other river.

With 58 different game plans it should keep you very occupied, and as it is possible to complete some of them without seeing all the locations, you will be back for "just one more go".





AUTHOR MIKRO-GEN
PRICE £9.95
GRAPHICS 14 FIRST IMPRESSION 16
SOUND 18 LASTING IMPRESSION 18
POLISH 18 VALUE 18
COMMENT Too difficult for the Ed!

SPINDIZZY

If you can afford to fritter away your change in the arcades you'll be familiar with Marble Madness. It involved rolling a ball across a gridded landscape, negotiating tight bends, narrow ledges and sheer cliffs. Like so many other arcade favourites, it found its way on to a home micro. Now loads of software houses have clones written or planned, the first being Gyroscope from Melbourne "We've never seen Marble Madness, and anyway Gyroscope is totally different" House.

Now we have Spindizzy, a brilliant development of the theme which leaves its rivals for dead and, even so early into 1986, must surely be a contender for Game of the Year.

Spindizzy is a huge game, 400 screensful, which takes the gridded slopes of Marble Madness, complicates them with all manner of ramps, walls, tunnels, lifts and trampolines (honest!), stirs in some fiendish logic puzzles and tops the whole thing off with beautiful graphics and animation which will have owners of other computers drooling. This game is an Amstrad original, and although there will doubtless be conversions, it's hard to see how they can match this.

The object of Spindizzy is to explore the map and collect the flashing jewels which are scattered about it. Some are easily accessible, others perched in devious locations which will need all your skills at problem-solving and joystick control of your spinner, known as Gerald the upside-down triangle.

Often it is not just a matter of selecting the correct route, you need to alter the actual characteristics of parts of the maze by deducing the functions of the icons which litter the floor of the map. These icons are activated by running Gerald over them, but it isn't always that simple – some icons deactivate others, or need to be switched in the right order or at specific times.

Some examples. One icon you'll encounter quite early in the game is a lift, activated by moving on to it. It raises you to a higher walkway leading to an adjacent screen, and lowers you back again when you return.

A much tougher problem is posed by the castle area, which is initially sealed off. How to get the door open? It involves finding which screen elsewhere on the map has the door control, activating this icon, and then finding out how to get back off the screen without deactivating the door. Naturally, the deactivation icon lies on the only exit . . .

Game play is against the clock, and there are no lives to lose as such. Normally the clock counts down slowly, but each spinner destroyed decreases the time left by five. Collecting a crystal increases the time and it's a good idea to hit the brake sparingly because it penalises you with a much faster clock rate during use.

It's only too easy to lose spinners – much of the map is set over water, or a drop to infinity, and a misstep results in death. And as the game features true inertia and momentum, if you fall too far on to a solid surface your spinner disintegrates into four pieces with a lovely snapping sound. Conversely a good run-up to a ramp lets you leap wide gulfs.

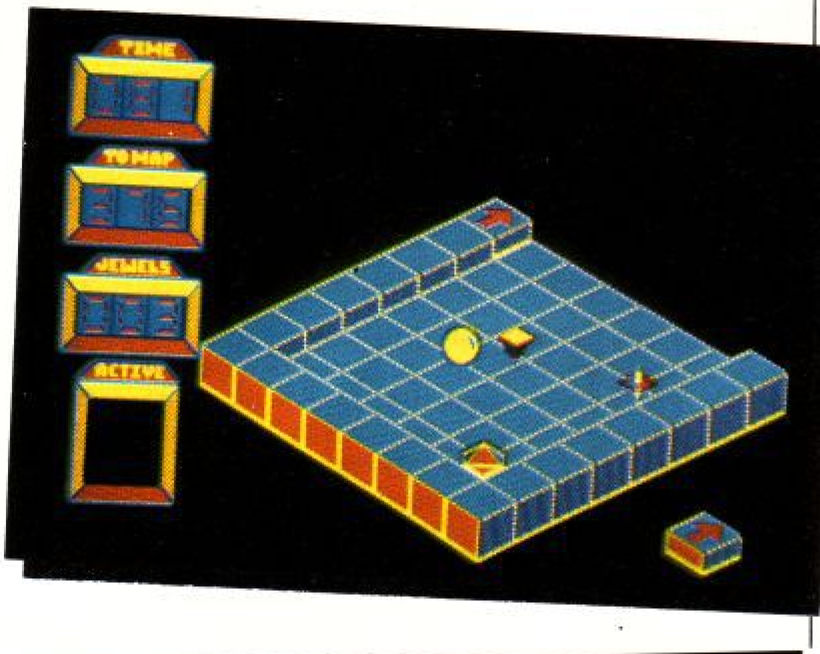
The game uses Mode 1 to great effect. The restriction to four colours is hardly a limitation, as clever stippling creates a range of hues and shading effects. Moreover, the colour scheme changes in different parts of the map, giving a welcome variety.

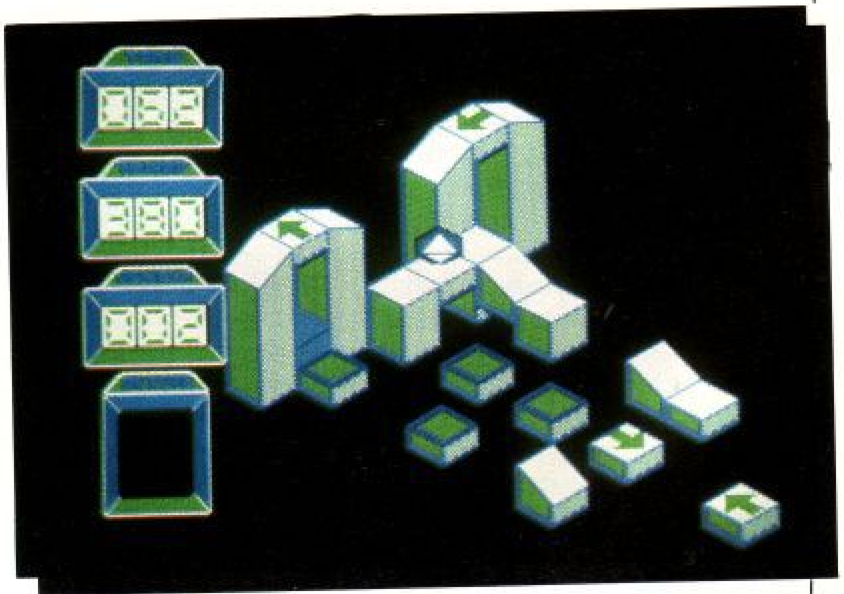
The overall map can be called up at any time to check your progress: it shows your current position, which screens you have visited and which of those still have jewels left in them.

The program is full of delightful touches which gives it real class. For example, the spinner's initial appearance is an upturned, spinning pyramid (see the photographs). But if you tire of this, a keypress changes it to either a marble or a gyroscope. Other keys alter your 3D viewpoint to any of the compass points, which is often essential.

Many scenes have tall walls and ramps and the true 3D animation means that crystals, and your spinner, may be hidden from sight in some directions. A compass block indicates true north so you don't lose your bearings on the map. Finally, any monochrome Arnolds out there can relax, as the programmer has provided a green-screen option which fixes the colour scheme to a set that works best on such monitors.

Addictive, surreal, challenging, professional – do yourself and your Amstrad a favour, and get a copy of Spindizzy today.

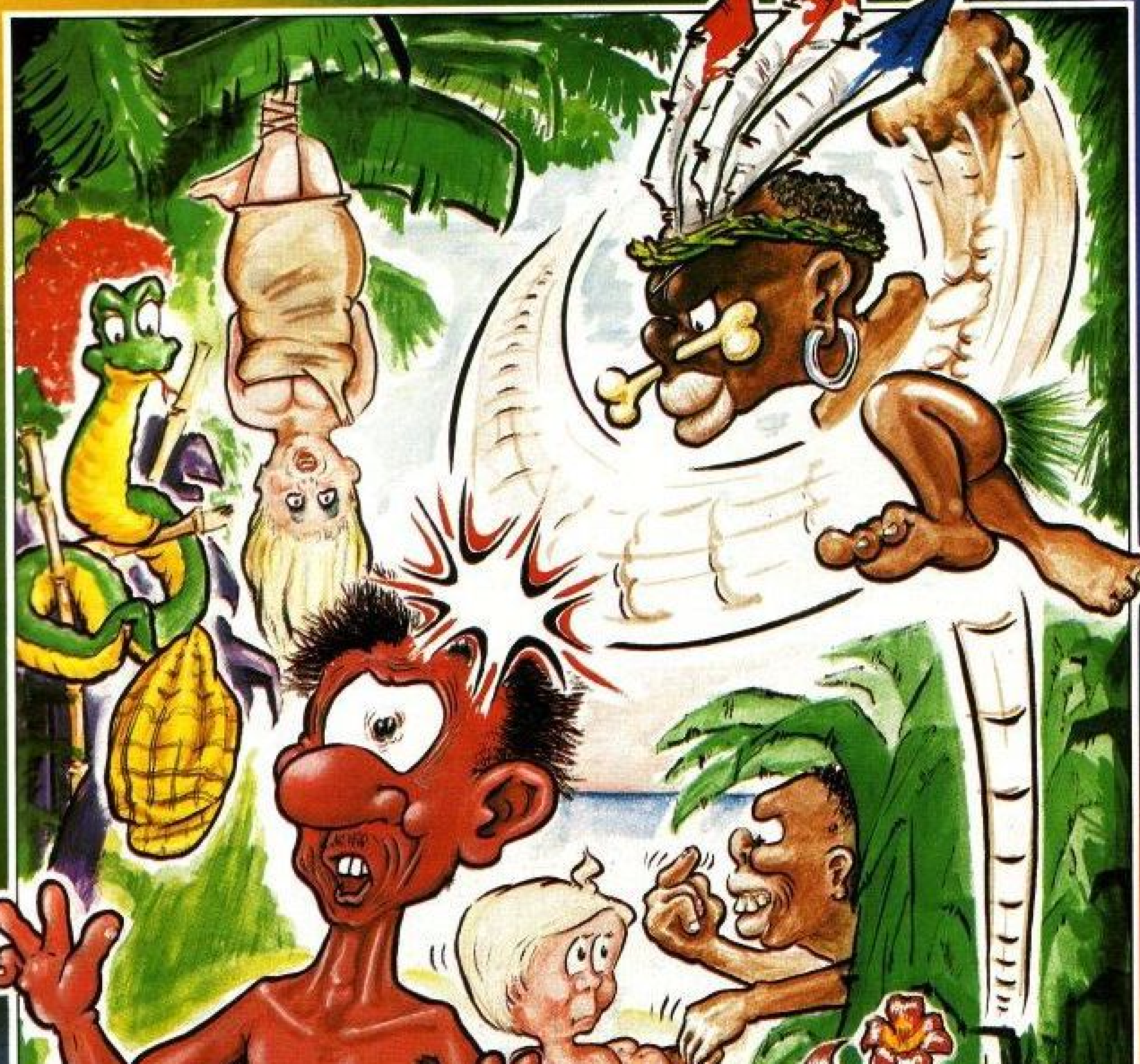




AUTHOR Activision/Electric Dreams
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GRAPHICS 19 FIRST IMPRESSION 18
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POLISH 19 VALUE 19
COMMENT Simply brilliant

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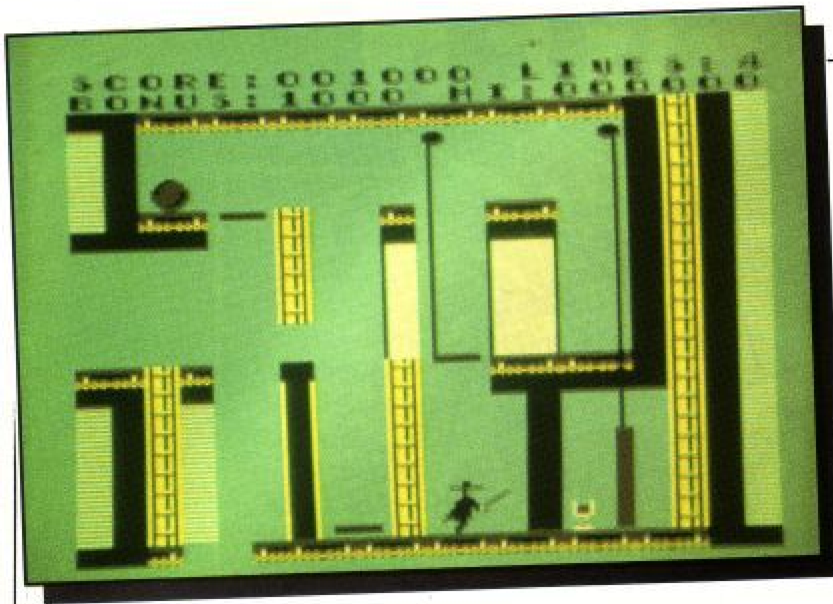
MIKRO-GEN



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AUTHOR US Gold
PRICE £7.95
GRAPHICS 9 FIRST IMPRESSION 11
SOUND 8 LASTING IMPRESSION 14
POLISH 17 VALUE 14
COMMENT Slizh, Slash, Slizh

ZORRO

I suppose every character of popular fiction is destined to appear in some computer game or other. Now it's the turn of Zorro, the masked avenger. In this game from US Gold, Zorro has to free the señorita from the wicked Captain who has abducted her and imprisoned. I expect you get the drift.

Anyway, the whole idea is to get past various obstacles on various screens with the aid of various objects. The Captains' men are patrolling the town, so watch out or you will have to fence them off. Sorry, I mean fight them off. Zorro can run left and right and jump. There are ladders and vines to climb up. Also there are hand rails that Zorro can use to span gaps, paratrooper style.

Dotted around the town are a number of objects such as sofas and big red rubber balls on which Zorro can bounce. The objects that can be found have special purposes. However, despite long hours of game play the only item out of a key, a bottle, a rubber plant, and a square thingy (that might be a step ladder or a pair of trousers), that I can find a use for, is the key, which opens a door.

The graphics are quite good but they look very like the Commodore 64 variety. This is not really surprising as Amstrad Zorro is bound to be a conversion of the code developed on the Commodore.

Sound is fairly sparse with only a few actions being accompanied by sound effects.

Zorro is a game of average proportions. Average sound, average graphics, average addictiveness. It is neither stunning or very original. Some will find it entertaining and will keep at their keyboard for a long while trying to sort out which object does what, but I think most game players will find it a bore.

LE 5EME AXE

A quick sortie to the Paris Amstrad Computer Show bagged a couple of really good games previously unseen in Britain. This is one of them.

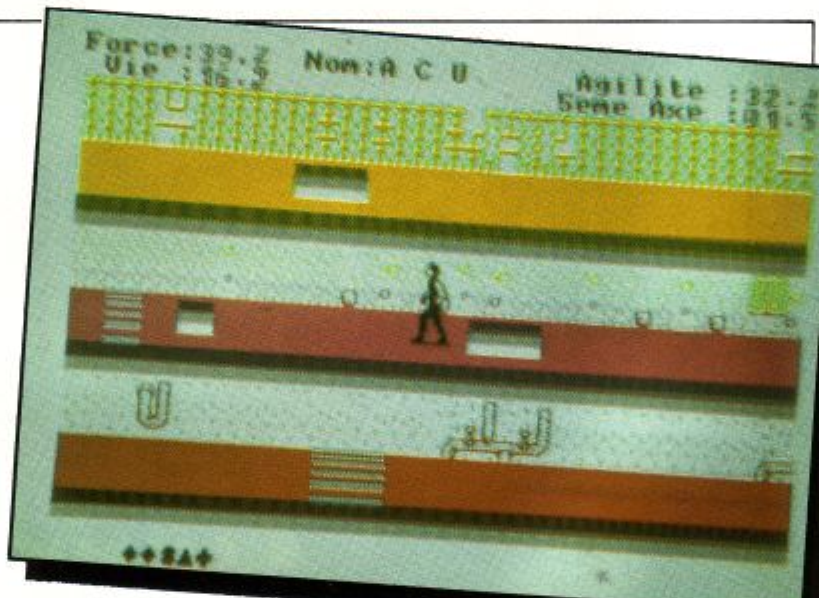
Professor Gern B. Dick has been involuntarily déclenchéd on a planétoïde artificiel. This is probably a huge inconvenience for him but it won't bother you much. However it does provide you with the excuse to explore a large underground world and beat the daylights out of assorted robots.

The game starts with you, a normal looking and presumably French humanoid, standing on level one of a multi-level world. The humanoid sprite remains in the centre of the screen with the world scrolling by. Joystick control will also allow you to leap the holes in the floor. If you don't succeed you'll fall through to the next level. There are blue zebra-crossings that will hurl you up a level. Dotted around are square, round, and diamond shaped black objects. These correspond to holes in the wall near the holes in the floor. The right object will allow you to cross the holes and reach other parts of the complex.

While skipping around in your carpet slippers you'll probably bump into the odd robot or two. And when I say odd I mean odd, but beautifully animated. To dispose of them, a few Karate kicks or a dash of Kung Fu will convert them to scrap.

After a certain number of objects have been collected you go to an intermediate stage between games. This has you running along a temple corridor while unseen foes hurl spears at you. You can jump, duck, or fend off the spears but if you fail to get the timing right you'll end up with one through your head, stomach or feet.

Should Le 5ème Axe make its way across the Channel you can look forward to seeing its brilliantly animated sprites. I think it has some of the most imaginative creatures I've seen in computer games and I look forward to being able to read the instructions and play the game properly.



AUTHOR LORKIELS
PRICE UK price to be decided
GRAPHICS 19 FIRST IMPRESSION 18
SOUND 19 LASTING IMPRESSION 20
POLISH 19 VALUE 20
COMMENT Brill french prog

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TLL

Hot on the heels of Highway Encounter, the last release from Vortex, comes TLL. This consists of a semi-3D view of a landscape filled with trees, houses, lakes and the like. You control a tornado fighter on a bombing sortie, the aim being to drop bombs on strategically placed targets shown as a small circle on the map. As your plane flies across the landscape the background scrolls in all four directions allowing you to move this scrolling window over the much larger map.

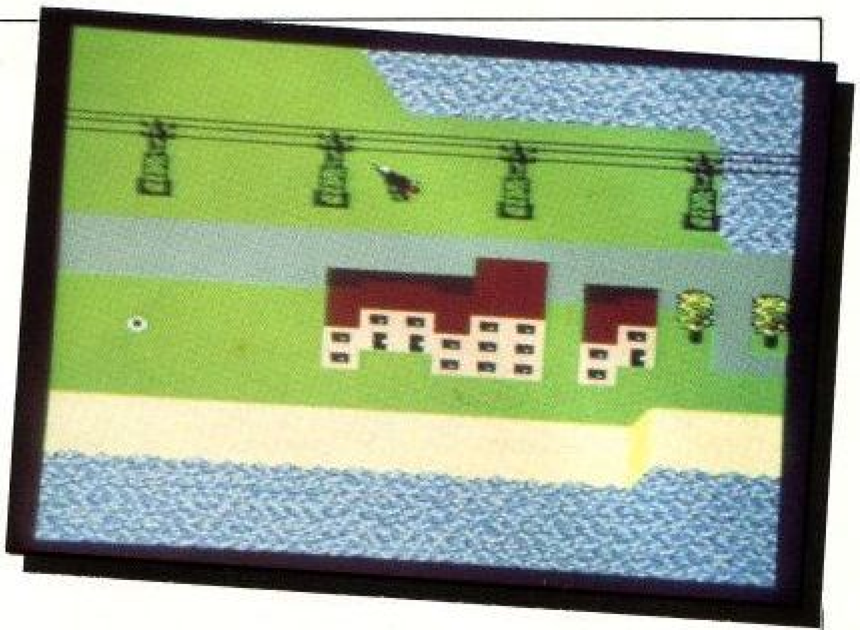
One great feature is the shadow of the aircraft that is cast on the ground. As you fly over a building the shadow is seen to go up the side then across the roof in a very lifelike fashion. This is quite important, as it allows your height to be judged.

Once the target has been located you must go down low both to be sure of hitting the target and also so that your speed drops to a manageable level. If you pull back on the joystick the aircraft gains height and speed until it is flying supersonically and the swing wings are pulled in. When you are flying fast you have to be very careful where you choose to push the joystick forward to slow down for the sudden loss of height will probably leave you splattered up the side of one of the buildings.

Left and right movement of the joystick causes the plane to bank and hence turn in 45 degree steps giving the eight possible directions for flight. Pushing the M key shows a mode one status screen which includes a complete map.

Graphically the game is quite brilliant and its concept is reasonably novel. Technically it is a masterpiece. The speed at which the 16k of screen memory is scrolled about, especially in supersonic flight, is quite outstanding.

I don't doubt that you can probably learnt to become pretty good at controlling the fighter, but for the first time user it doesn't exactly instill confidence when you can get through your three jets faster than you can say Super Etandard.



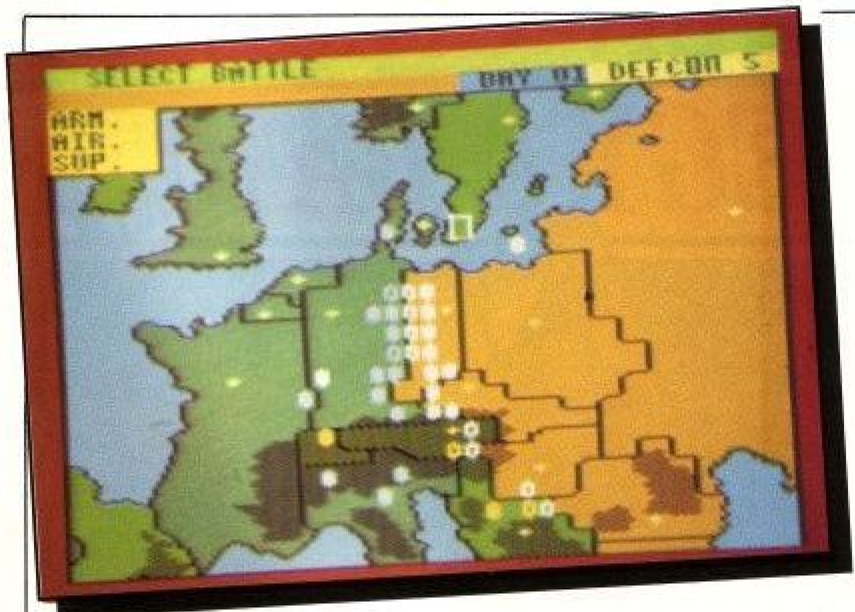
AUTHOR Vortex

PRICE £8·95

GRAPHICS	17	FIRST IMPRESSION	15
SOUND	17	LASTING IMPRESSION	18
POLISH	18	VALUE	17

COMMENT Bombing for Beginners

THEATRE EUROPE



Theatre Europe is the latest release for the Amstrad in the PSS Wargames Series. It simulates the battle for Europe when the Third World War comes. This is not the happiest of subjects for a computer game, and some people will consider it in bad taste. My opinion is that any scenario that challenges the intellect and educates is valid provided it doesn't trivialise serious matters.

The game shows you a map of Europe on which the Nato and Warsaw Pact units are lined up against each other across the East German border. There are four stages to every game turn – movement, attack, supply and air phase.

The game can be played almost entirely with the joystick. A cursor is moved around the screen and over the required unit. As the cursor passes over each square the terrain or the details about the unit are displayed. Pressing the fire button selects a unit if it belongs to your force. The cursor is then moved to an adjacent square and fire moves the piece or selects a unit to attack.

The next stage is called special missions. Among the options are strategic chemical launches, strategic nuclear launches and all-out blanket attacks. Your enemy gets the chance to strike back so there seems little advantage in initiating a nuclear or chemical attack unless it is to break the opposition attack.

After each attack phase there is a supply stage in which a number of supply points can be distributed to bolster up individual units. The air phase gives you the chance to try and retain air superiority by careful management of your air force resources.

The screen at the end of the game says something like "Civilisation destroyed → press any key to try again".

If only it was that simple . . .

AUTHOR PSS

PRICE £8·95

GRAPHICS	11	FIRST IMPRESSION	14
SOUND	12	LASTING IMPRESSION	16
POLISH	11	VALUE	16

COMMENT Advanced Warfare



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CLUEDO

OK, so it plays Cluedo now. Hands up all you people who have played computerised board games before? Right, now how many played the next round on good, old-fashioned printed cardboard? I think I have just proved a point.

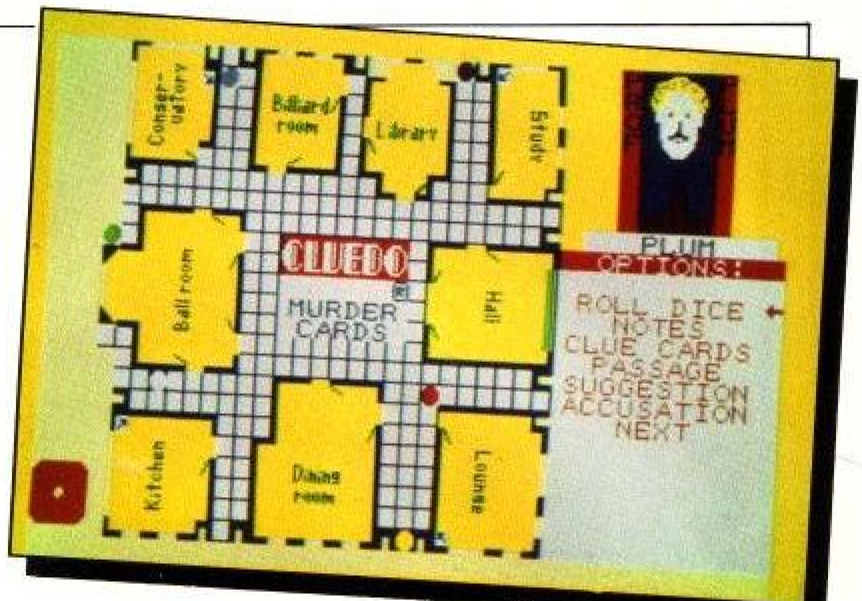
These Waddington games are wonderful – in their original form. The Amstrad versions are a pale shadow of the real thing, probably not helped by them being really awful Spectrum conversions. This game asks you if you are using a colour *television?* Methinks they missed that one.

So let's see what you get for your er . . . how much does it cost Ed? *(£9.95 – Ed).* Thank you. Right, a genuine green cardboard box, a lot of plastic moulding that holds the cassette and fills up most of the box, a distruction leaflet (mostly a mass of ©s, ®s, and TMs), a sticker advertising the film of the game, and a little booklet of detective note sheets that everyone will shove through a photocopier.

You get to roll a computer generated dice down the left-hand side of the screen, though it looks more like it is having a fit than rolling. You then move your character the requisite number of places. Be warned! if you cheat by moving it too far too often it seems to forfeit you your move. This may be a feature or a bug, I'm not sure.

Anyhow, accusations fly back and forth like Sikorsky vs. the European consortium as per your usual Cluedo, except you can't see your clue cards. These are stored in the computer until you want to look at them. Then you tell everybody else to look at the ceiling while you put your mit over the corner of the screen and see what you got.

This is indeed a computerised version of Cluedo and is a direct take-off of the original, but with less cheating. I prefer the original board games on boards, though the computer version does have one advantage – little brother doesn't nick the gun for his Action Man.



AUTHOR Leisure Genius
PRICE £9.95

GRAPHICS	11	FIRST IMPRESSION	5
SOUND	10	LASTING IMPRESSION	2
POLISH	4	VALUE	7

COMMENT Loses in the translation

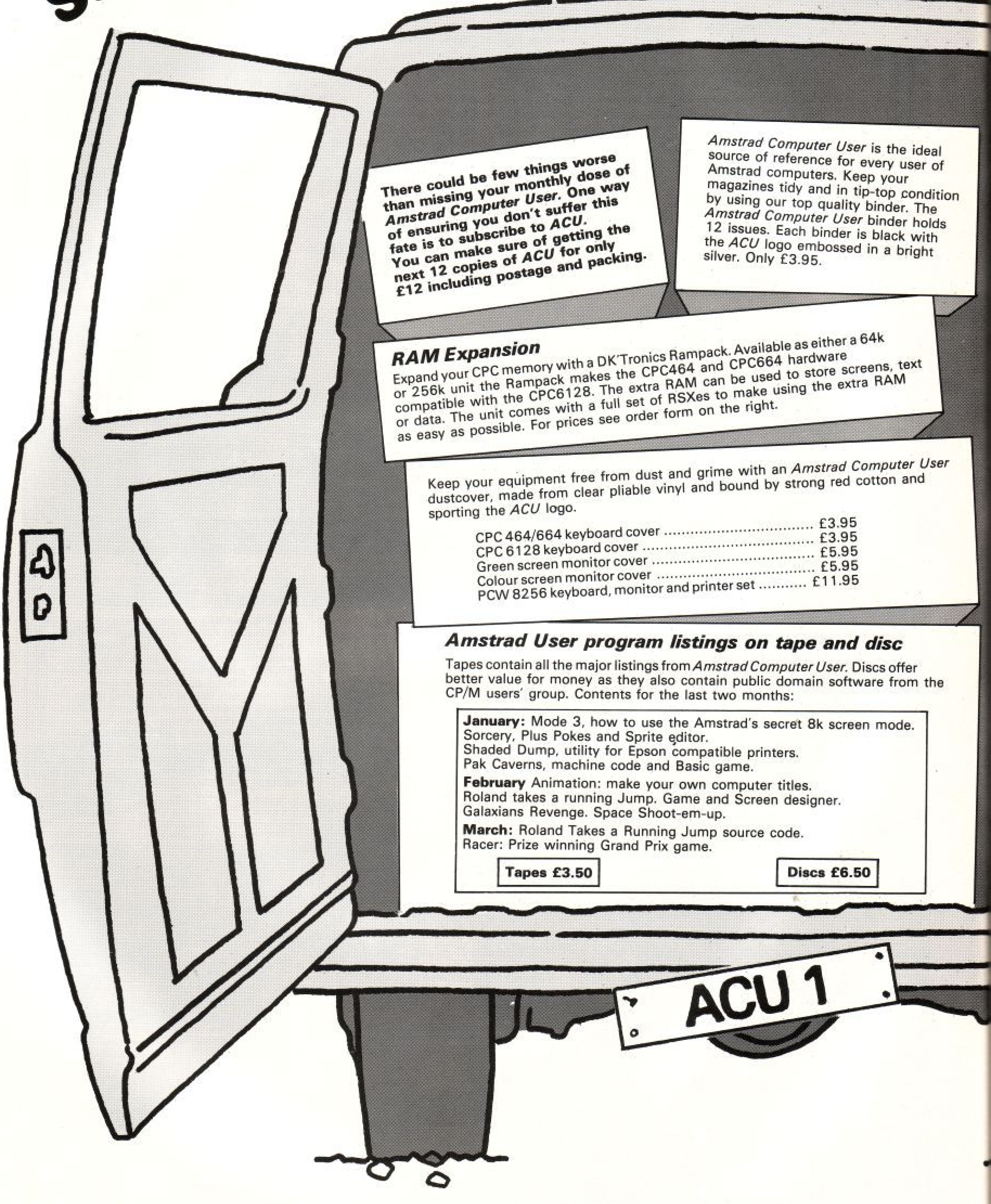


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How to get your screens in a twist ...

By Alexander Martin. Original Bankman code and airoplane concept by Roland Perry

When the 664 and 6128 were produced, parts of the operating system were altered to make it possible to do things that the old firmware wasn't flexible enough to allow. Using the new flexible firmware a smooth screen animation effect can be produced from Basic. This article includes RSXs that will allow a Basic programmer to use this feature and also a Basic program that illustrates its use.

We have provided the code to allow users of the 664 to set up the RSXs. If you have a 6128 then the RSXs are already provided for you as part of the Bank Manager package. This is explained in the section for 6128 owners. You can follow the procedures below to set up the example without having to know how it works.

664 owners

Type in the Hexloader program and save it. Then run it. It will produce and save a binary file containing the RSXs which you then load and run with the RSXloader program. Type in the example program and save it. You should now have all four programs on disc. Reset the machine for a 'clean start'. Now run the RSXloader program. Next run the example program.

6128 Owners

Filecopy Bankcode.bin onto a disc. Type in the Bankmanloader program and save it. Type in the example program and save it. You should have the three files on a disc. Reset the machine for a 'clean start'. Now run the Bankmanloader

HEXLOADER

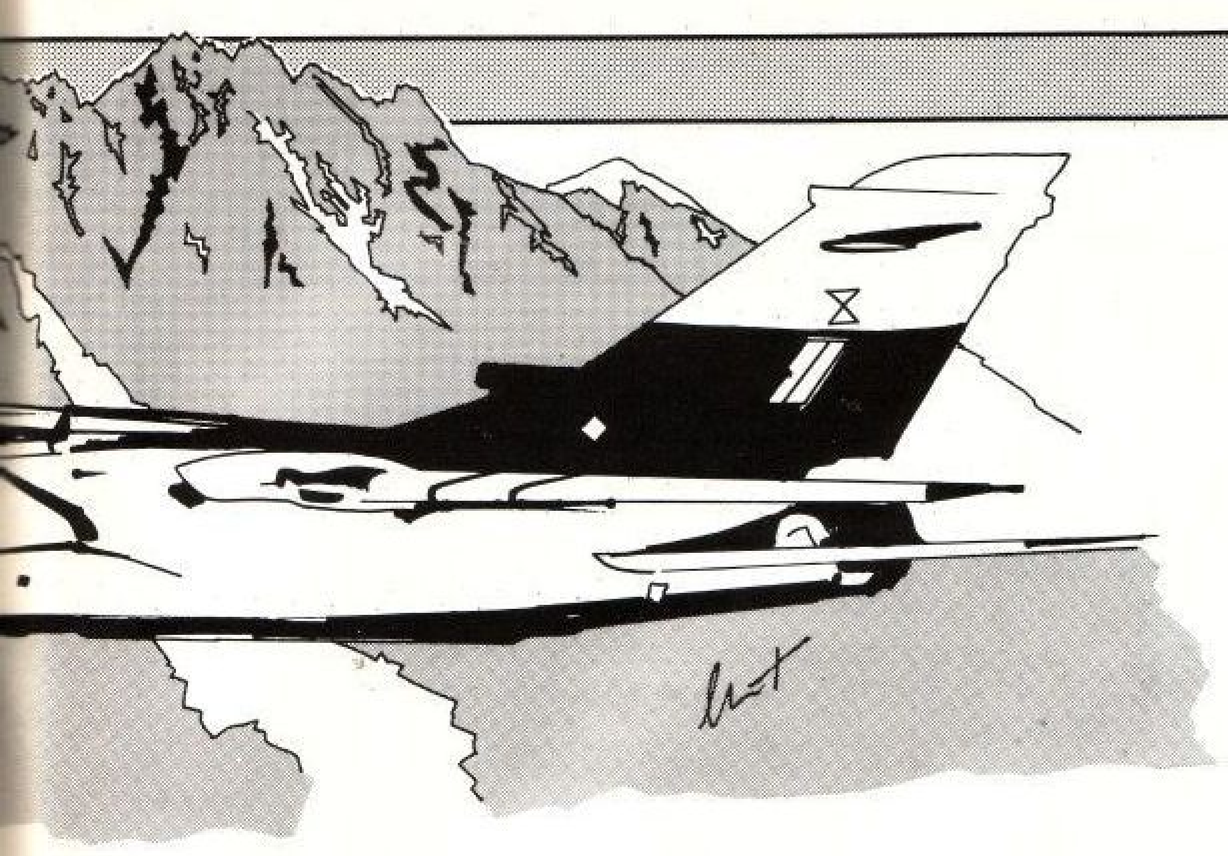
```
10 ' hexloader for 664 owners
20 '
30 MEMORY &7FFF
40 addr=&8000
50 FOR ln=1000 TO 1370 STEP 10
60   READ bigdata$
70   checksum=VAL(MID$(bigdata$,18))
80   checkall=checkall+checksum
90   FOR pointer=1 TO 16 STEP 2
100     byte$=MID$(bigdata$,pointer,2)
110     c$=MID$(byte$,1,1):GOSUB 210:c$=
   MID$(byte$,2,1):GOSUB 210
120     result=VAL("&"+byte$)
130     POKE addr,result
140     addr=addr+1
150     checksum=checksum-result
160 NEXT pointer
170 IF checksum<>0 THEN PRINT"CHECKSUM E
   RROR IN LINE";ln,bigdata$:STOP
180 NEXT ln
190 IF checkall=28581 THEN SAVE"democode
   ",b,&8000,&130 ELSE PRINT"Incorrect
   number of data lines"
200 STOP
210 IF INSTR("0123456789ABCDEF",UPPER$(c
   $))=0 THEN PRINT"TYPING ERROR IN LIN
   E";ln,bigdata$ :STOP :ELSE RETURN
220 '
230 '
1000 DATA 21E1E9223000F7EB 1055
1010 DATA 212100194E234623 309
1020 DATA 79B02855E5606919 877
1030 DATA E54E234660691944 706
1040 DATA 4DE1712370E118E4 1039
1050 DATA 600063006A007500 418
1060 DATA 78007B007E009900 522
1070 DATA 9C009F00AC00B400 667
1080 DATA BA00BF00C900CE00 784
1090 DATA E000E800EE00F600 940
1100 DATA FB00030110011701 296
1110 DATA 1B01000000000000 28
1120 DATA 000000003EC932F9 562
1130 DATA FF21A100CDD4BCD8 1270
1140 DATA 21F9FF110080B7ED 1102
1150 DATA 5230062183000C31D 524
1160 DATA 010199002159000C3 472
1170 DATA D1BC546F6F204C6F 922
1180 DATA 770D0A4261642043 504
1190 DATA 6F6D6D616E640D0A 659
1200 DATA A100C3A900C3DD00 941
1210 DATA 564945D75644D500 810
1220 DATA FE01C21A01DD7E00 823
1230 DATA FE02D21A01B7280F 731
1240 DATA CD0801E5F52A5700 817
1250 DATA CD05BC3EC0180DCD 894
1260 DATA 0801E5F52A5500CD 815
1270 DATA 05BC3E40CD08BCF1 961
1280 DATA E1C355BDFE01C21A 1169
1290 DATA 01DD7E00FE02D21A 840
1300 DATA 01B7280DCD08013E 513
1310 DATA C0CD08BC2A570018 746
1320 DATA 0BCD08013E40CD08 564
1330 DATA BC2A5500C305BCCD 908
1340 DATA 0BBCFEC020042257 802
1350 DATA 00C9FE40C0225500 830
1360 DATA C9218C007E23CD5A 830
1370 DATA BBFE0A20F7C90000 931
```

RSXLOADER

```
10 'rsx loader for 664
20 '
30 MEMORY &3FFF
40 LOAD"democode.bin",&8000
50 CALL &8000
60 PRINT"now RUN the EXAMPLE program"
```

EXAMPLE PROGRAM

```
15 ENT-1,1,1,1
20 REM mountains
30 DEFINT a-z
40 INK 0,1:INK 1,26
50 INK 2,6:INK 3,6
60 FOR i=4 TO 7:INK i,9:NEXT
70 FOR i=8 TO 15:INK i,20:NEXT
80 SYMBOL 252,0,0,&C,&1F,&30,&7F,&FF
90 SYMBOL 253,0,6,&E,&F2,2,&F2,&FE
100 SYMBOL 254,0,&60,&70,&7F,&7F,&7F,&7F
110 SYMBOL 255,0,0,0,&F8,&EC,&FE,&FF
120 pr$=CHR$(254)+CHR$(255)
130 pl$=CHR$(252)+CHR$(253)
140 FOR scr=0 TO 1:|VDU,scr:MODE 0
150 RANDOMIZE 1:RANDOMIZE RND
160 DEG:ORIGIN 0,150:CLG:MOVE 0,150
170 FOR x=16 TO 640 STEP 16
180  DRAW x,COS(x)*150+RND*100,4
```



program. Next run the example program.

Now it can be told

The RSXs used in the example program are hidden away inside Bankcode.bin. When RSXs are used, they have to be loaded into memory as a binary file and then CALLed to log them on. If you CALL the Bank Manager RSX code with a parameter this will automatically log on the two additional RSXs. To simplify the Bankmanager explanation in the 6128 manual, these additional commands were hidden away and undocumented.

```
BANKMANLOADER

10 'rsx loader for 6128
20 '
30 MEMORY &3FFF
40 LOAD"BANKMAN.BIN",&8000
50 CALL &8000,1
60 PRINT"now RUN the EXAMPLE program"
```

How does it all work?

There are two 16k areas of RAM that can be used as screen memory. The default is the area above &C000 which we've called Screen 0. The other is referred to as Screen 1 and resides at &4000 up. It is the process of switching between these two screens that allows the animation effect to be achieved. The firmware on the 664 and 6128 differs from the 464. The 464 firmware assumes that a read or write to the screen operates on the currently displayed screen. The 6128 and 664 firmware does not make this assumption and writes to the screen it has been told to write to.

This is the documentation for the two RSXs:

|VDU,n

This changes the screen area being used. The parameter n should be either 1 or 0.

|VIEW,n

This changes the screen area being displayed. This command does not change the screen being written to (by commands like PRINT, PLOT, DRAW) or read from (like TEST and COPYCHR$). The parameter n should be either 1 or 0.

About the example program

Within the example program |VDU is used for two purposes. To select the screen to display and to select the screen to write to. |VDU is immediately followed by |VIEW in several places. This is so the firmware is set to write into one screen and then told to display the other. |VDU will always set the screen to write to and the screen to display.

The animation is achieved by setting the computer to display one screen while erasing the old image on the other. The new image is then drawn in and the displayed screen changed to reveal it. This requires that the old position of the character for each screen is recorded making the animation technique horrendously complicated.

You can see how the program works by 'REMing out' the RANDOMIZE commands in line 150. This draws a slightly different range of mountains in each screen producing a 'Rhubarb and Custard' effect.

Using the RSXs in your own programs

You can use the RSXs in your own programs by using the loaders to load and log on the RSXs. Both Bankcode.bin and the code created by Hexloader are relocateable. You will have to be careful about where in memory you place the RSXs as the lower screen space &4000 to &7FFF must be clear. This is the reason HIMEM is set to &3FFF using the MEMORY command.

ACU

```
190 NEXT x
200 MOVE 0,0:FILL 4
210 cx=175:GOSUB 270
220 cx=525:GOSUB 270
230 NEXT scr:|VIEW,0
240 GOTO 350
250 '
260 '
270 MOVE cx,100
280 FOR x=0 TO 360 STEP 10
290  DRAW cx+SIN(x)*50+10*RND,100+COS(x)
    *25+10*RND,1
300 NEXT
310  DRAW cx,100:MOVE cx,90:FILL 1
320 RETURN
330 '
340 '
350 TAG:MOVE 0,0,,1
370 rx=-32:ry=100:x=rx:y=ry:GOSUB 610:or
    x1=rx:ory1=ry
380 lx=672:ly=100:x=lx:y=ly:GOSUB 620:ol
    x1=lx:oly1=ly
390 |VDU,0:|VIEW,1:GOTO 470
400 |VDU,0:|VIEW,1
410 x=orx0:y=ory0:GOSUB 610 'erase old p
    lanes  on 0
420 x=olx0:y=oly0:GOSUB 620
430 rx=rx+4:ry=50*SIN(rx)+100:lx=lx-8:ly
    =ly+crash*2
440  IF lx<-64 THEN lx=672
450  IF rx>672 THEN rx=-32
460 scr=0:GOSUB 630
470 x=rx:y=ry:GOSUB 610:orx0=rx:ory0=ry
    'draw new on 0
480 x=lx:y=ly:GOSUB 620:olx0=lx:oly0=ly
490 |VDU,1:|VIEW,0
500 x=orx1:y=ory1:GOSUB 610 'erase old p
    lanes on 1
510 x=olx1:y=oly1:GOSUB 620
520 rx=rx+4:ry=50*SIN(rx)+100:lx=lx-8:ly
    =ly+crash*2
530  IF lx<-64 THEN lx=672
540  IF rx>672 THEN rx=-32
545 IF ly<-150 THEN INK 0,26:FRAME:FRAME
    :INK 0,1:ly=100:lx=672:crash=0
550 scr=1:GOSUB 630
560 x=rx:y=ry:GOSUB 610:orx1=rx:ory1=ry
    'draw new on 1
570 x=lx:y=ly:GOSUB 620:olx1=lx:oly1=ly
580 GOTO 400
590 '
600 '
610 MOVE x,y,2:PRINT pr$;:RETURN
620 MOVE x,y,8:PRINT pl$;:RETURN
630 FRAME:IF scr=1 THEN |VDU,0 ELSE |VDU
    ,1
640 found=TEST(lx+4,ly-12):IF found=2 OR
     found=3 THEN crash=-4:SOUND 129,25,
    400,15,,1,15
650 |VDU,scr
655 IF scr=1 THEN |VIEW,0 ELSE |VIEW,1
660 RETURN
```

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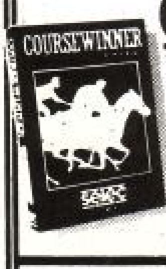
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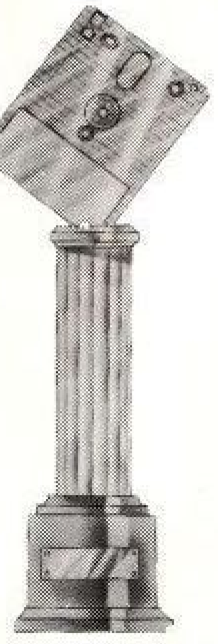
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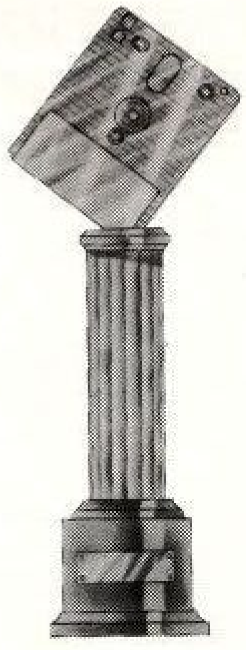
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Amstrad User Awards



This first Amstrad User Awards proved very popular, the results seem to reflect the sales of programs as much as their popularity. Sorcery and Sorcery Plus walked away with the top prizes, it was voted program of the year, game of the year, arcade strategy game of the year, best graphics, and original program. Virgin took the prize for Software House of the Year. Original program is probably not deserved since it is a conversion, but as most Amstrad programs are conversions of one kind or another to disallow it would have left very few options.

Mini Office seemed to be the equivalent business program, showing that a lot of Arnolds are being used for semi-serious purposes.

The worst program of the year shows how right Amsoft are to concentrate on the Amsoft Gold range, "3D invaders" is used as an expletive in the magazine office.

Book of the Year was biased by having an Amazing Amstrad Omnibus competition in the same issue. It is good, but not so good that it should get more than twice as many votes as the nearest rival. The fourth place for the firmware manual was well deserved, it is good to see Soft 158 being noticed even if it was not first put on sale in 1985.

One of the nicest surprises was the third place for Defend or Die. This has been one of the Editor's favourite games for a long time but no one else seems to have noticed it.

Program of the Year
1. Sorcery/Sorcery Plus
2. Way of The Exploding Fist
3. Knight Lore
4. Starion

Game of the Year
1. Sorcery/Sorcery Plus
2. Way of the Exploding Fist
3. Daley Thompsons Decathlon
4. Hyper Sports

Utility of the Year
1. Mini Office
2. Dk'Tronics Light Pen Software
3. Maxam
4. Quill

Peripheral of the Year
=1. DD1, DMP 2000
2. Dk'Tronics Lightpen
3. Dk'Tronics Speech Synthesiser
4. AMX Mouse

Business Program of the Year
1. Mini Office
2. Amsword/Tasword
3. Masterfile
4. New Word
5. Protext

Software House of the Year
1. Virgin
2. Ultimate
3. Melbourne House
4. Level 9

Worst Program of the Year
1. Grand Prix Driver
2. 3D Invaders
3. North Sea Bullion Adventure
=4. Assault on Port Stanley, View to A Kill, Sultans Maze

Bargain of the Year
1. Non Terraqueous
2. Soul of A Robot
3. They Sold A Million
4. Computer Hits 10

Shoot 'Em Up of the Year
1. 3D Starstrike
2. Starion
3. Defend or Die
4. Harrier Attack

Book of the Year
1. Amazing Amstrad Omnibus
=2. Amstrad Computing
3. The Working Amstrad
4. Firmware Specifications Manual

Arcade Strategy Game of the Year
1. Sorcery
=2. Lords of Midnight, Knight Lore
=4. Alien 8, Dun Darach, Pyjamarama

Best Adventure of the Year
1. Red Moon
=2. Lords Of Midnight, Return to Eden
4. Dun Darach

Best Music of the Year
1. Ghostbusters
2. Sorcery
3. Jet Set Willy
4. Jammin'

Best Graphics of the Year
1. Sorcery
2. Knight Lore
=3. Starion, Pyjamarama, Way of the Exploding Fist

Original Program of the Year
1. Sorcery
2. Decathlon
3. Highway Encounter
=4. Knight Lore, Psychadelia, Hacker

The Least Significant Bit

I'll start off by saying that this hasn't been much of a month for happenings. No magazines bought and sold, no new Amstrad computers launched, no significant events at all. *(What do you mean? Jane Nolan got her hair cut – Ed.)*

Sinclair "launched" (ha!) the Spectrum 128 for £40 more than they will be charging as soon as the Spectrum Plus stocks have subsided. Will there be a clamour from Spectrum Plus Owners for upgrades (remember the CPC664? Amstrad do . . .)?

Acorn discovered that once you are locked into the British educational "system" you have become institutionalised and can get away with almost anything.

The one event

Amstrad made £27 million on their first half year trading, representing net margins of 21 per cent. This is almost unheard of in any business, let alone one as volatile as the computer marketplace. Anyone in the Amstrad orbit should be delighted, since although your first reaction may be that Amstrad is overcharging (yet everyone is amazed how cheap the PCW 8256 is) it means that Amstrad is here to stay. Stability in this business is a very valuable commodity for users.

These results are very significant. They show just how much more vicious the pricing could get if someone was foolish enough to take them on – and they also show that Amstrad has got plenty of reserves to take product development further forward if they so choose. And judging by the meanness of the dividend, they certainly intend to do something with the money!

In a spin

Games on disc are a serious issue to the CPC6128 owner, yet why are so few available? The cost to publishers to invest in stocking the outlets with discs is horrific, hence Amstrad and their clout have cornered the market for the time being.

It's about time some alternative approach to distributing games on disc made them more readily accessible to disc system owners. This might also stem the publishers' concern about the piracy arising from transferring from cassette to disc.

It is a lot easier to copy protect an original disc than a cassette (tape to tape duplication is always possible – that's how the things are made in the first place).

The Queen's English

The primary dictionary with the spell checker provided with NewWord's companion Spell Plus program has recently been Anglicised (Anglicized?). You will also find that words like Amstrad are present. however, it's a big job to do and the current releases could still use a little weeding, so NewStar are offering a refund of the purchase price of £69 to the user sending in the most Americanisms still present in the latest release.

Pin the tail on the donkey!

No prizes for guessing what everyone is suggesting Amstrad will launch next. The only uncertainty concerns the final configuration and the final price.

Well, we'll let you into a little secret, it has a 500 mbyte sequential filing optical disc, tape backup and removable hard disc unit. Honestly. *(And a built-in teasmade –Ed.)*

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